CHEMICAL LIBRARY

Only a Few Years Ago a Headquarters for American Pharmacy Was a Dream, Now It Is a Vision and in 1930 It Will Become a Realization.

Vol. XVIII, No. 12 DECEMBER, 1929

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

JAN 2 1930

TRADE MARK

CONTENTS

Frontispiece and Sketch—J. G. Beard 1221

Editorial:

At the Threshold of Another Year 1222
The Museum of the A. Ph. A. Headquarters as a Depository for Original Materia Medica Specimens 1222
Pharmacy Week of 1929 an Outstanding Success 1223

Scientific Section:

Black Chokeberry Bark as a Substitute for Viburnum Cassinoides—Youngken 1225
Stability of Anæsthetic Ether in Containers of Various Types—Van Deripe, Green and Schoetzow 1228
Solubility Determinations of U. S. P. Chemicals—Schnellbach and Rosin 1230
Comments on the U. S. P. X Test for Rhapontic Rhubarb—Konnerth and Schoetzow 1235
Bioassay of Capsicums and Chillies I—Munch 1236
Quantitative Analytical Methods for the Study of Peroxide Formation in Ether—Van Winkle and Christiansen 1247
A Further Study of the Incompatibility between Sodium Salicylate and Sodium Bicarbonate—Krantz, Jr., and Carr 1250

Bibliography of Pharmaceutical Research—DuMez 1252
Physicians' Prescriptions in Relation to the U. S. P. and N. F. Preparations—Kolb 1255
Notes on Some Official Preparations—Utech 1256

Department of Business Management:

Comments, Questions and Suggestions Are Invited and Welcome 1259
Popularizing the Preparations of the United States Pharmacopœia 1259
Shall the Independent Druggist Sink or Swim? It Depends upon His Initiative and Effort—Heine 1262

The Department of the American Association of Colleges of Pharmacy:

Prescription Consciousness—Dirstine 1265
Proceedings of the Local Branches 1268
Association Business 1272
Editorial Notes 1274
Personal and News Items 1277
Obituary 1279
Book Notices and Reviews 1281
Index III

Advertising—Cover Pages 2, 3 and 4 and pp. I-XXIV.

Published Monthly by the American Pharmaceutical Association: Office of publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 10 West Chase St., Baltimore, Md.

Annual Subscription, $4.00; Single Numbers, 35 Cents.

THE 78th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN BALTIMORE, DURING WEEK OF MAY 5, 1930.

The 1930 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Baltimore, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3, 1917; authorized July 10, 1918.

HEPCENTRATE

An extract of the fresh mammalian liver

Presents the *water soluble nitrogenous*, protein free, extractives of the liver.

Hepcentrate is put up in boxes of 20 vials, the contents of each vial representing 100 grams, about 3½ ozs., of the fresh liver.

Orders for Hepcentrate will be promptly filled.

FAIRCHILD BROS. & FOSTER
New York

Display the Sign of the Prescription Pharmacy

A A A *Profits*

Money is money—but sales of S. & G. "safe and guaranteed" Products carry good-will-engendering properties that have far-reaching and very tangible effect on your business growth—and the profits derived therefrom can well be classed as 3-A. S. & G. pharmaceuticals are accepted with confidence because it is widely known they cannot safely be replaced by substitutes.

Anusol HEMORRHOIDAL **Suppositories**

Break the Vicious Circle in Hemorrhoids

Indicated in all inflammatory conditions of the proctologic area. Guaranteed free of narcotics, irritant or habit-forming ingredients.

Atophan

For the relief and treatment of Rheumatic Conditions

Unrivaled anti-rheumatic, analgesic anti-inflammatory, giving prompt, efficient, rational relief in Rheumatism, Gout, Neuralgia, Neuritis, Sciatica, Lumbago.

ARCANOL

For the relief and treatment of "Colds"

The markedly successful remedy for "Colds," etc. Compound tablets of Atophan and Acetyl-salicylic acid (aspirin).

Our efforts to help you sell S. & G. Products never cease. Our policy of accepting unsold merchandise in salable condition for exchange or refund, warrants your keeping up your stocks.

Your wholesaler will promptly supply you.

SCHERING & GLATZ, Inc. 84–92 Orange St. Bloomfield, N. J. 41–43 Maiden Lane New York, N. Y.

THE SERVICE OF PHARMACY.

AN APPRECIATION OF THE A. PH. A. BY A STATE ASSOCIATION PRESIDENT.

"I CAME away from this meeting (A. PH. A., in Rapid City) of America's outstanding pharmacists, with a deeper appreciation of pharmacy as a profession and a feeling of security for us so long as we try to live up to the ASSOCIATION'S high ideals."

"My hope is that every retail pharmacist will affiliate with the AMERICAN PHARMACEUTICAL ASSOCIATION. The JOURNAL alone is worth the price of the annual membership. Most of the important papers of the convention will be published during the year and I am certain that many things discussed therein will give you new ideas related to pharmacy which will aid in its professional development."—From a report of President Carl E. Nelson, Indiana Pharmaceutical Association, as delegate to the A. PH. A.

LETTER OF ACKNOWLEDGMENT OF ELECTION TO HONORARY MEMBERSHIP AND RECOGNITION OF A. PH. A. SERVICES.

(*Colloidal Chemistry and Pharmacy.*)

THE following parts of a letter from Prof. Dr. Wolfgang Ostwald to the AMERICAN PHARMACEUTICAL ASSOCIATION are quoted. (The standing of Dr. Ostwald in colloidal chemistry is so well known that no further statement is necessary.)

"I beg of you to accept my sincere thanks for the extraordinarily great honor your ASSOCIATION has conferred upon me, an honor which I feel is out of proportion to any personal merits of mine in your special field of work. I therefore must come to the conclusion that in reality it is the Science of Colloidal Chemistry upon which you intended in the first place to confer this distinction, a science to which, as far back as half a century ago, your veteran member, John Uri Lloyd, made contributions of fundamental importance. It seems to me that the public recognition of this Science by the AMERICAN PHARMACEUTICAL ASSOCIATION is evidence of an unusual degree of acumen and scientific far-sightedness."

PHARMACY AND ALKALOIDAL CHEMISTRY.

F. W. A. SERTUERNER laid the foundation of alkaloidal chemistry; his discovery was followed soon after by those of other pharmacists. In the closing paragraph of an address Dr. P. J. Hanzlik said: "Now on the 125th anniversary of this important discovery (morphine), we reaffirm our gratefulness for the timely effort and native talent of the once obscure pharmacist of Paderborn."

SCHEELE THE APOTHECARY.

SOME writers and men of science seem to think that pharmacists prefer another designation than that of "pharmacist"—they do not; they have pride in their profession, seek to promote its service and educational advancement.

Last year pharmacists of Sweden celebrated the 150th anniversary of their organization; as early as 1621 King Gustavus Adolphus recognized the importance of pharmacy by granting pharmacists royal privileges; the decree stipulated that no new shops were to be opened without authorization by the state.

Karl Wilhelm Scheele, as a youth, was apprenticed to an apothecary in Gothenburg; he lived only 44 years; most of these years were lived in his apotheke, but in estimating his work and its results, pharmacists have an inspiration, and a pride is instilled in them as members of the profession.

J. G. BEARD.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVIII DECEMBER, 1929 No. 12

THE PRESIDENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

The president of the American Association of Colleges of Pharmacy is a member of the faculty of the School of Pharmacy, University of North Carolina. He graduated from the latter institution in 1909, and since his graduation he has been on its teaching staff, being advanced to full professorship in 1919. Seemingly the number 9, as an end figure, marks the beginnings of a number of events and activities in the life of John Grover Beard.

The subject of this brief sketch has been chairman of the A. PH. A. North Carolina Membership Committee (since 1919); also, vice-chairman of the House of Delegates. He was local secretary for the AMERICAN PHARMACEUTICAL ASSOCIATION for the meeting held in Asheville; he is a past-secretary and former chairman of the Section on Education and Legislation, A. PH. A.

Professor Beard has served as vice-president of the American Association of Colleges of Pharmacy, is chairman in District 5 section meetings, was chairman of the Teachers' Conference on Commercial Pharmacy, 1927–1929, and has held other important offices in the organization of which he is the head.

He is vice-president of the Conference of Pharmaceutical Association Secretaries and a member of its Executive Committee. He was president of the Elisha Mitchell Scientific Society, 1917–1919, and is a member of Kappa Sigma and Kappa Psi fraternities. As secretary-treasurer of North Carolina Pharmaceutical Association and as editor of the *Carolina Pharmacist* he has been and is eminently successful in state association work. Among other responsibilities of President Beard is that of the chairman of the Committee on Pharmaceutical Syllabus. The indices of the JOURNAL A. PH. A. give many references under his name to addresses and papers of interest and value.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

A Merry Christmas and a Happy New Year.

AT THE THRESHOLD OF ANOTHER YEAR.

EVERY year brings to that which follows some unfinished work. The members of the AMERICAN PHARMACEUTICAL ASSOCIATION can look back upon the events of 1929 with a high degree of satisfaction in the accomplishments of the waning year, but, with the assurance that much work remains to be done in 1930. The annual meeting held in Rapid City was well attended; its transactions have been reported in the last three issues of the JOURNAL and the members have had an opportunity for studying them. The report on the Headquarters project is most encouraging and the work accomplished points to further opportunities; the results thus far transcend the hopes of several years ago—then it was a dream, now it is a vision and next year it promises to be a realization. The subject has been carefully presented in detail by the Chairman and commented on editorially, with confidence that the members will continue their support to make the American Institute of Pharmacy the greatest achievement of American pharmacy—this is a Christmas Wish and a New Year's Hope.

THE MUSEUM OF THE A. PH. A. HEADQUARTERS AS A DEPOSITORY FOR ORIGINAL MATERIA MEDICA SPECIMENS.

BEFORE the erection of the American Institute of Pharmacy—the name proposed for the Headquarters Building—is even begun, a suggestion of great importance has been made with respect to the museum which is to be one of the principal features of the Institute. Dr. H. H. Rusby, at the recent meeting of the National Conference of Pharmaceutical Research, in Rapid City, pointed out that authenticated samples of drugs should be preserved in the American Institute of Pharmacy so that when occasion demands these may serve for identifying other specimens; likewise constituents and preparations. He brought the thought into his address at the Hanbury Medal presentation when he referred to the work of Sir Clement Markham on Cinchona, which to a great extent was nullified because of an error in the determination of the plant upon which a large part of his effort was expended. In a related way he referred to Apocynum, Strophanthus, Viburnum and a number of drugs, the reputation of which has suffered because they are not of the source which gained recognition for them. He mentioned the fact that Dr. Thomas Lloyd had discovered collectors gathering *Cactus grandiflorus* in a country where the genuine plant does not exist. The following paragraph is quoted from the address:

"In my opinion, it would not be going too far to decree that no report of research work in pharmacognosy, chemistry, pharmacodynamics or therapeutics shall be regarded as valid or given serious recognition unless such report shall state where authenticated samples of the material employed have been perma-

nently deposited. The earlier in the history of the drug that this can be done, the better, but it is never too late, as witness Farwell's recent tracing of *Cascara amarga* to the genus *Sweetia*, in the family *Papilionaceæ*, whereas no student of materia medica ever expected it to be referred to any other family than the *Simarubaceæ*. It is notable that Farwell has taken pains to preserve specimens of the bark and of the tree yielding it."

As in all other things, there are limitations, but there are possibilities of great value in this suggestion for service in the interest of public health in which pharmacy has a large part. In a communication Dr. Rusby mentions that original botanical determinations may have been erroneous and, if posterity has nothing more than the name, the establishment of exact facts is very difficult. Unless we have original materials for examinations there is no definite understanding of the exact plant that was used under the original name; the interpretation of a botanical name may be changed as we come to know it and its allied species.

"One of the most general and perennial of human regrets is that most of the results of experience of one generation are not preserved for the use of the next generation." This is in a degree applicable to Pharmacopœial and National Formulary revision—investigations are pursued in one revision which must be renewed in a succeeding one, whereas if the records and evidence are preserved doubts and arguments can be settled.

The references herein chiefly concern botany, pharmacognosy and pharmacology, but it points to larger opportunities of service through the American Institute of Pharmacy.

PHARMACY WEEK OF 1929 AN OUTSTANDING SUCCESS.

PHARMACY Week of 1929 has been a greater success than that of preceding years and has found increased favor in countries where a try-out was given last year—the idea now being accepted as an opportunity for acquainting the people with the mission of pharmacy; and in other sections of the world the initial effort of this year has been most encouraging.

The continued and progressive success of Pharmacy Week will depend on properly carrying the messsage of pharmacy to the public by means of publicity that will have cumulative value. No one questions that the practice of pharmacy is a means for livelihood—Pharmacy Week is a part of an educational system for acquainting the public with the profession of pharmacy—that it is an important activity in various divisions of public health work.

Those who for one reason or another seek to belittle pharmacy as an integral of their business are unwilling to discontinue the sale and dispensing of medicine, because they know that public confidence rests on pharmacy. The requirements for pharmaceutical practice, therefore, not only demand the qualifications exacted by the state for the protection of the public, but for impressing on all who practice pharmacy a full appreciation of the obligations assumed and a corresponding regard for their professional standing.

The extent of the Pharmacy Week program is greater than most pharmacists realize, because it is difficult to estimate the efforts put forth by individuals, firms

and local organizations. Details of the big national promotions (and international) have been reported, but even so, these were productive of other efforts. For example, the maps used in window displays have attracted the attention of teachers and librarians, who recognize in them sources of information, the results of which may be viewed from various standpoints as influential, educational and commercial factors, the inchoation traceable to Pharmacy Week—if pharmacists will be mindful of their opportunities.

No one can estimate the audience of radio broadcasts, for quite a number who have no direct interest in pharmacy added brief messages commending Pharmacy Week; to the latter and the larger number who in one way or another share in pharmaceutical and drug-trade activities the thanks for coöperation are due; after all, the fullest measure of success and prosperity is possible for each division when all recognize their common interests for the welfare of those they serve. In addition to the nation-wide broadcast over the Red and Blue network the message of Pharmacy Week was given over local stations by pharmacists of prominence.

The fine publicity of magazines, dailies and weeklies and advertising services contributed by wholesalers, manufacturers and publishers gave support to the metropolitan newspaper service and brought the message of pharmacy to the attention of all who have a desire to be informed. To all who participated in this wonderful effort the body-pharmaceutic expresses appreciation and thanks.

Local associations and alumni took advantage of the occasion for getting together in meetings, and several of these organizations honored individuals for outstanding services rendered to pharmacy. The success of all of this was promoted by committees and the untiring efforts of officers, guided by the chairmen. The enthusiasm and encouragement of the latter have found expression in the fact that the National Executive Committee is already formulating plans for the sixth annual observance of Pharmacy Week in October of 1930.

OFFICERS-ELECT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Board of Canvassers of the AMERICAN PHARMACEUTICAL ASSOCIATION—composed of L. F. Bradley, A. C. Taylor and R. L. Quigley, all of Washington, D. C.—has announced as the result of the mail ballot for officers of the ASSOCIATION, the election of the following:

President, H. C. Christensen, Chicago, Ill.

First Vice-President, Walter D. Adams, Forney, Texas.

Second Vice-President, D. B. R. Johnson, Norman, Okla.

Members of the Council (for three years), H. V. Arny, New York, N. Y.; T. J. Bradley, Boston, Mass.; W. B. Day, Chicago, Ill.

These officers will be installed at the next annual meeting of the ASSOCIATION in Baltimore, Md., May 5–10, 1930.

E. F. KELLY, *Secretary*.

SCIENTIFIC SECTION

BLACK CHOKEBERRY BARK AS A SUBSTITUTE FOR VIBURNUM CASSINOIDES.*[1]

BY HEBER W. YOUNGKEN.

While investigating the Viburnum situation in the Southern United States during the month of June 1929 the writer put up with a drug collector near Pineola, North Carolina, who, upon request, escorted him to a nearby ravine and pointed out the kinds of shrubs from which some of the Shonny Haw bark was collected in that region.

It was apparent that two entirely different barks were being gathered and marketed from this section, one called by my host "True Shonny Haw" and a second which he termed "Buck Shonny Haw."

The shrubs termed "True Shonny Haw" proved to be *Viburnum cassinoides* L., while those called "Buck Shonny Haw" were identified by the writer as a variety of Black Chokeberry known to botanists as *Aronia melanocarpa* Elliott **var.** *grandifolia* Schneid.

From June 8th to June 10th the writer botanized within a radius of about 10 miles in this section of North Carolina and came upon a large number of these plants.

Fig. 1.—*Aronia melanocarpa* Elliott **var.** *grandifolia* Schneid. Leaf and flowering branch. (× 1/4)

DESCRIPTION OF ARONIA MELANOCARPA VAR. GRANDIFOLIA.

The plants observed in the vicinity of Pineola on June 8th to 10th were shrubs from 5 to 8 ft. in height growing on the sides of woodland hills and were in flower at the time of observation. They had alternate, obovate to broad obovate and ovate leaves, lustrous dark green on the upper surface and pale green, glabrous on the lower surface, with abruptly acuminate to mucronate apices and crenate-serrulate margins, up to 8 cm. long and up to 5 cm. broad. The flowers were white, pentamerous, and arranged in axillary corymbs. The fruits of all the *Aronias* are described by Bailey (1) and Rehder (2) as small pomes without grit cells in flesh.

Herbarium sheets of leaf and flowering branches of this material were later verified as to diagnosis by Dr. Alfred Rehder of the Arnold Arboretum.

* This investigation was aided by a grant from the A. PH. A. Research Fund.

[1] Scientific Section, A. PH. A., Rapid City meeting.

DESCRIPTION OF STEM BARK.

The stem bark exhibits an outer surface which varies from grayish brown to purplish brown and is smooth, shining and striped transversely, in areas, having circular to ovate, raised lenticels, the latter arranged lengthwise. Its inner surface is whitish to light brown, longitudinally striate. Its fracture is tough-fibrous, the inner bark separating in irregular layers. Its odor is indistinct and its taste is astringent and slightly bitter.

MICROSCOPIC DESCRIPTION OF STEM BARK.

Transverse, radial-longitudinal and tangential-longitudinal sections of this bark were examined separately in water, chloral, phloroglucin-CHl, and iodine water mounts with the following observations:

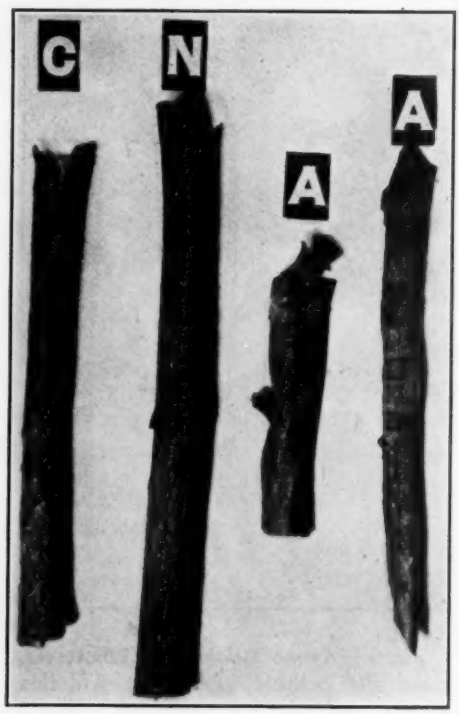


Fig. 2.—*A*, stem bark of *Aronia melanocarpa*, Elliott, **var.** *grandifolia*, Schneid. *C*, stem bark of *Viburnum cassinoides*, L. *N*, stem bark of *Viburnum nudum* L. (× 1/2)

The cork is of subepidermal origin and composed of tangentially elongated cells with suberized walls and frequently reddish to occasionally purplish red or purple contents. The outer and inner walls of the cork cells are more thickened than the radial ones, showing at times thick deposits of suberin which form convexities encroaching upon the cell lumen. Surface sections of this tissue show cells mostly elongated longitudinally.

The phellogen exhibits tangentially elongated cells, in cross sections, with protoplasmic contents.

The secondary cortex consists of several layers of somewhat collenchymatic cells containing chloroplastids and in some cases rhombohedral crystals of calcium oxalate in young and middle-aged bark.

The primary cortex is composed of parenchyma cells, elongated tangentially in cross sections and isolated groups of sclerenchyma fibers. Some of the parenchyma cells contained brownish red to purplish red to purple contents, but the majority of these contained granular contents and tannin.

The pericycle resembles somewhat the cortex, consisting of a parenchymatous zone containing interrupted groups of lignified pericyclic fibers. Some of the parenchyma cells contain rhombohedral crystals of calcium oxalate, others tannin and granular contents.

The phloem consists of a broad zone divided into numerous phloem patches, as observed in cross sections, by numerous narrow, medullary rays which converge

in groups. Many of the phloem patches contain groups of lignified bast fibers resembling those of the primary cortex and pericycle. The medullary rays were mostly 1-cell wide, occasionally 1–2 cells wide in the tangential sections examined. The cells of these have fairly thick, beaded walls. Some contained rhombohedral crystals of calcium oxalate, others tannin and granular contents.

In radial-longitudinal and longitudinal-tangential sections the sclerenchyma fibers of cortex, pericycle and phloem exhibited an irregular lumen with rounded ends and lignified walls.

Many crystal fibers were found in these sections containing rhombohedral and rod-shaped crystals of calcium oxalate. In some cases 2 or 3 rods were found in the same cell.

No stone cells nor rosette crystals of calcium oxalate were present in this bark, nor was there any valeric acid odor present, even upon triturating it with phosphoric acid.

Fig. 3.—Black Chokeberry Bark, *Aronia melanocarpa* **var.** *grandifolia*. *K*, cork; *C*, cortex; *Pe*, pericycle; *pf*, pericyclic fibers; *P*, phloem; *bf*, bast fibers; *mr*, medullary rays. (× 65)

SUMMARY AND DISTINCTIONS.

A substitute for *Viburnum cassinoides* bark has been discovered which has been collected and offered on the market as Shonny Haw.

The plants yielding this substitute are identified by the author as a variety of the Black Chokeberry, scientifically known as *Aronia melanocarpa*, Elliott **var.** *grandifolia* Schneid.

A description of the flowering shrubs as observed by the writer near Pineola, N. C., is given. These differ from *Viburnum cassinoides* in several particulars among which are the obovate to broadly obovate leaves with crenulate-serrulate margins and abruptly acuminate to mucronate apices as compared with the elliptic, ovate, to ovate lanceolate leaves with acute to bluntly acuminate apices and irregular dentate to denticulate margins of *V. cassinoides*, the arrangement of the flowers in corymbs instead of compound cymes as in *V. cassinoides* and the small pome fruits as compared with the drupes with flattened stones of *V. cassinoides*.

The physical characteristics of the stem bark are described, the most important distinctions from the stem bark of *V. cassinoides*, previously described by the

writer (3), being the tough fibrous fracture, absence of valeric acid odor and slightly bitter taste as compared with the short, irregular fracture, valeric acid odor and more bitter taste of *V. cassinoides*.

A microscopical description of the stem bark of *Aronia melanocarpa* **var.** *grandifolia* is given for the first time. It is found to differ from the stem bark of *V. cassinoides* (3) in many particulars chief among which are the absence of rosette crystals of calcium oxalate and stone cell groups and the presence of rod-shaped crystals and numerous groups of sclerenchyma fibers.

REFERENCES.

(1) L. H. Bailey, "The Standard Cyclopedia of Horticulture," 1 (1922), 396.

(2) A. Rehder, "Manual of Cultivated Trees and Shrubs," page 384.

(3) H. W. Youngken, "Viburnum Cassinoides, a Recent Substitute for Viburnum Prunifolium," Jour. A. Ph. A., 17 (1928), 330–335.

E. L. Newcomb said that in the last five or ten years that the origin of some of our drugs has not been that which was formerly thought to be the source. He expressed appreciation of Dr. Youngken's investigations.

Massachusetts College of Pharmacy,
August 2, 1929.

STABILITY OF ANÆSTHETIC ETHER IN CONTAINERS OF VARIOUS TYPES.*

BY F. VAN DERIPE, L. W. GREEN AND R. E. SCHOETZOW.

It is the practice of European manufacturers to package anæsthetic ether in glass bottles, stoppered, some with glass stoppers, others with cork stoppers and still others with leadfoil-covered cork stoppers. Until about thirty years ago Squibb Ether was packaged in containers of the last named type. Due to slow but definite losses of ether by evaporation, and fire-hazard following possible breakage in shipping, this type of container was discontinued and hermetically sealed tin cans adopted by Dr. Edward R. Squibb.[1] Considerable experimental evidence over a number of years has shown that contact with metallic copper has a marked effect in preventing the decomposition of ether. Accordingly, Squibb Ether is now packaged in hermetically sealed tin cans, the interior of which is copper-plated.

In order to confirm the findings of Nitardy and Tapley[2] in regard to the superior keeping qualities of anæsthetic ether packaged in copper-plated cans over that packaged in tin cans and glass bottles, the following experiment was undertaken.

A batch of Anæsthetic Ether was subdivided into glass-stoppered amber bottles, ordinary tin cans and copper-plated tin cans. About one hundred and seventy containers of each type were put up, each container holding a quarter-pound of ether. These were stored in the dark, at room temperature for a period of fifteen months. Periodically, ten containers of each type were opened and

---

* Scientific Section, A. Ph. A., Rapid City meeting, 1929.

[1] Dr. Edward R. Squibb, *Ephemeris*, 2 (1884), 621.

[2] F. W. Nitardy and M. W. Tapley, Jour. A. Ph. A., 17 (1928), 966. *Anaesthesia and Analgesia*, 7 (1928), 318. *Brit. J. Anesth.*, 6 (1928), 53.

tested for peroxides[1] and aldehydes.[2] The following table gives the percentages of positive results found at each examination:

	Type of Container.					
	(a) Tin Can.		(b) Copper-Plated Tin Can.		(c) Glass-Stoppered Amber Bottle.	
Age in months.	Perox.	Ald.	Perox.	Ald.	Perox.	Ald.
1	90%	30%	0%	0%	0%	20%
2	90	90	0	0	0	0
3	90	60	0	0	30	0
4	100	40	0	0	70	0
5	100	100	0	0	20	0
6	100	100	0	0	90	70
7	100	100	0	0	100	100
8	70	90	0	0	100	90
12	70	90	0	0	100	90
15	40	100	0	0	100	90

The above data demonstrates again the action of copper in preventing the development of both aldehydes and peroxides in ether. It is evident that the copper-plated tin can is markedly superior to the glass bottle or ordinary tin can as a container for anæsthetic ether.

During this work and the daily control of ether, discrepancies have sometimes arisen in the aldehyde test. Investigation of these discrepancies has shown that,

1. The smaller the particles of potassium hydroxide, the more readily is the yellow coloration produced. Fragments about 3 mm. in size are recommended. Powder should be rigidly excluded.

2. A high grade of potassium hydroxide must be employed. Low grade material has been known to produce yellow coloration in contact with ether where higher purity potassium hydroxide did not.

3. Potassium Hydroxide test solution (U. S. P. X) is not nearly as sensitive as the solid potassium hydroxide in the detection of aldehydes. This is in accord with the finding of E. Mallinckrodt, Jr. (*J. A. C. S.*, 49 (1927), 2655).

Analytical Department of the Brooklyn Laboratories,
E. R. Squibb & Sons.

ABSTRACT OF DISCUSSION.

James C. Munch inquired whether the author had an explanation for the beneficial action of copper.

The author replied that it probably is due to the greater selectivity of the copper for oxygen.

F. W. Nitardy said that a rather elaborate piece of research work had been under way since the study was begun. The work would be completed within a year, it is hoped, and he would prefer not to go into the subject at this time; a number of interesting developments had come up in the research.

---

[1] Peroxides were tested for by the method of the U. S. P. X.

[2] Aldehydes were tested for by placing 30 cc. of ether and 5 Gm. of solid potassium hydroxide in fragments a few millimeters in size, into a glass-stoppered flask, placing this in the dark and agitating it occasionally during five hours. A yellow coloration showed the presence of aldehydes.

SOLUBILITY DETERMINATIONS OF U. S. P. CHEMICALS.

BY W. SCHNELLBACH AND J. ROSIN.[1]

THE WATER BATH AND THE AGITATION APPARATUS USED IN SOLUBILITY DETERMINATIONS.

The constant temperature water bath used was the "Freas Automatic" type. In this bath the temperature is regulated by means of a "Freas Thermoregulator" which keeps the temperature constant within plus or minus one-twentieth of a degree Centigrade. In a water bath of this type, the switchboard is usually mounted directly over the tank occupying considerable space. The heating element sockets are attached to the bottom of the switchboard. The inconvenience of this arrangement was eliminated by removing the switchboard to a position outside of the bath and running a cable from the heating elements in the bath to the socket on the bottom of the switchboard. This rearrangement (see Fig. 1) of the water bath permitted the use of an immersed agitation apparatus and, in addition, the insertion of a copper-wire test-tube rack around the inner edge of the tank. The rack was used to allow subsidence of the excess solute. Sixteen tubes could be attached to the agitation apparatus at one time, while as many as ten tubes could be placed in the rack.

Fig. 1.

The stirrer consisted of a brass shaft carrying two brass discs. The shaft was mounted to a light frame, also made of brass. The discs were perforated so that test-tubes could be attached to both sides by rubber bands (see Fig. 2). This apparatus was entirely immersed into the water bath. A motor was used to revolve the discs at a rate which could be varied from 8 to 32 revolutions per minute by means of two cone-shaped wooden gears. The revolution of the tube, end over end, insures perfect agitation.

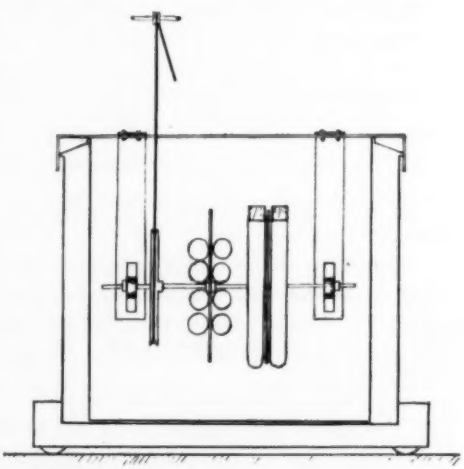


Fig. 2.

[1] Continued from JOUR. A. PH. A., 18 (1929), 762.

THE SOLUBILITY OF SODIUM SULPHATE ($Na_2SO_4.12H_2O$) IN GLYCERIN AT 25° C.

The sodium sulphate used for the solubility determination was of U. S. P. quality according to the label of the bottle and the results of the U. S. P. tests. The glycerin was also of U. S. P. quality. Its specific gravity was 1.2497 (25° C.)/(25° C.) (density = 1.246 (25° C.)/(4° C.)) which corresponds to a percentage of between 95 and 95.5 per cent of pure glycerin, the balance being water.

In determining the solubility of sodium sulphate duodecahydrate in glycerin a several-phase system is created which involves the same possibilities of change in solubility as it was the case with magnesium sulphate heptahydrate in glycerin. The aspect is discussed under solubility of magnesium sulphate (*loc. cit.*, page 770[1]). The solution of Experiment II was prepared with a small excess of sodium sulphate in order to limit the interference suspected to be caused by the water of crystallization of the excess solute. The finely crushed sodium sulphate was mixed in a proportion of 7.8 Gm. of sodium sulphate plus 92.2 Gm. of glycerin and kept at 25° C. while constantly agitated. Experiment I indicated the solubility to be close to this value. A very slight amount of solute remained undissolved after ten days. The analysis of the solution resulting from this experiment yielded results close to those of the solution prepared by the super-saturation method in Experiment I.

The solutions were analyzed by two methods. Method I is described under "Sulphate Determination" (see first paper[2]) and Method II, based upon the determination of sodium, will be described further on.

The average of all the above results is 7.52. *Conclusion: 7.52 grams of sodium sulphate duodecahydrate are present in 100 Gm. of a glycerin solution saturated at 25° C.*

Therefore: One gram of sodium sulphate duodecahydrate is soluble in 9.87 cc. (equivalent to 12.30 Gm.) of glycerin at 25° C.

SOLUBILITY DETERMINATION OF SODIUM NITRITE IN ALCOHOL AT 25° C.

The sodium nitrite used in this determination was the granular variety of U. S. P. quality. Also the alcohol applied in this determination conformed to the U. S. P. requirements. The specific gravity was 0.810 (25° C.)/(25° C.) (equal to 0.808 (25° C.)/(4° C.)) corresponding to 94.9 per cent by volume.

The sodium nitrite assayed according to the U. S. P. method 96.66 per cent of $NaNO_2$ when taken from the bottle without previous drying. On drying over sulphuric acid at room temperature it lost 1.2 per cent of weight. In addition to the U. S. P. assay the sample was also examined for nitrate, chloride and sulphate. It showed the presence of nitrate and chloride. A ten per cent solution of sodium nitrite matched the opalescence of an 0.003 per cent solution of sodium chloride on the addition of silver nitrate. The sodium nitrite contains therefore approximately 0.03 per cent of sodium chloride.

The oxidimetric method for the determination of $NaNO_2$ as given by the U. S. P. was not suitable for the analysis of the alcoholic solution produced in solubility determination. The assay method recommended for nitrates was

[1] JOUR. A. PH. A., 18 (1929), 770.
[2] *Ibid.*, 18 (1929), 766.

therefore adopted. Accordingly the nitrite was converted into NaCl by repeated evaporation of the solution after previously acidifying with hydrochloric acid. The residue was then dissolved in water and the water evaporated repeatedly until the residue was neutral to litmus paper. The resulting sodium chloride was titrated directly with tenth-normal silver nitrate solution; K_2CrO_4 being used as indicator.

TABLE IV.—RESULTS OF THE SOLUBILITY DETERMINATION OF SODIUM SULPHATE (Na_2SO_4-$12H_2O$) IN GLYCERIN AT 25° C.

Stated as Percentage of Solute in Solution.

Experiment.	Method of analysis.	Time of preparing solution, days. 10.	50.	74.
I				
Prepared by supersaturation method	Sulphate determination	..	7.63	..
		..	..	..
	Sodium determination	..	7.48	7.49
		..	7.49	7.49
II				
Prepared by undersaturation method	Sulphate determination	7.67	..	..
		7.33	..	..
	Sodium determination	7.61	..	..
		..	..	..

By this method the original salt assayed a total of 98.44 per cent of $NaNO_2$ including the nitrate and chloride. The actual percentage of $NaNO_2$ may be calculated as follows: 98.41 (= 98.44 −0.03 chloride) per cent include sodium nitrite and sodium nitrate which is also calculated as nitrite. Stating the composition of the commercial sample of sodium nitrite as known from the obtained data, 0.36 per cent remain to make 100, viz.: 98.41 ($NaNO_2$ and $NaNO_3$ calculated as $NaNO_2$) + 0.03 (NaCl) + 1.20 (loss of weight on drying) = 99.84. The 0.36 per cent are obviously nitrate oxygen. The sodium nitrite analyzed contains, therefore, a percentage of nitrate which is equivalent to 0.36 Gm. of oxygen. $O : NaNO_3 = 0.36 : x . -x = 1.91$ Gm. of $NaNO_3$ which is equivalent to 1.51 Gm. of $NaNO_2$ in which form the nitrate was calculated with the analyses. The original salt contains, therefore, approximately (98.41 −1.55 =) 96.86 per cent of $NaNO_2$. This result conforms fairly close to the oxydimetric assay.

TABLE V.—RESULTS OF THE SOLUBILITY DETERMINATION OF SODIUM NITRITE IN ALCOHOL AT 25° C.

Stated as Percentage of Solute in Solution.

Experiments.	Time of preparing solution, days. 2.	4.	9.
I	1.398	1.398	...
Prepared by undersaturation method	(1.420)	(1.420)	...
	1.408	1.401	...
	(1.430)	(1.423)	...
II	1.485	1.460	1.403
Prepared by supersaturation method	(1.509)	(1.483)	(1.425)
	1.434	1.444	...
	(1.457)	(1.467)	...

The average of the results of Experiments I (2 and 4 days) and II (9 days) is 1.424. *Conclusion: 1.424 grams of sodium nitrite (of the above stated composition) are present in 100 Gm. of U. S. P. alcohol solution saturated at 25° C.*

Therefore: One gram of sodium nitrite (of the above stated composition) is soluble in 85.43 cc. (equivalent to 69.03 Gm.) of U. S. P. alcohol at 25° C.

The results of solubility determination shown in Table V were calculated based on the argentometric analyses of the original salt. The values in parenthesis represent the corresponding amount of sodium nitrite of the above stated composition, 98.44 Gm. of $NaNO_2$ found argentometrically being equal to 100 Gm. of the commercial sodium nitrite.

SOLUBILITY DETERMINATION OF ARSENIC TRIOXIDE IN WATER AND GLYCERIN AT 25° C.

The arsenic trioxide used for this determination was of U. S. P. quality. It was in the form of a fine powder appearing crystalline under the microscope. On drying over sulphuric acid the loss was negligible. Two methods were used in analyzing the solutions obtained in the solubility determinations. The first method was used for the aqueous solutions only. It consisted in evaporating the solution and drying the residue to constant weight at 100° C. The second method was the titration with tenth-normal iodine solution. This method was used for both the aqueous and the glycerin solution. The tenth-normal iodine solution was standardized against a tenth-normal arsenic trioxide solution prepared from arsenic trioxide analytical chemical.

SOLUBILITY IN WATER.

The rate of solubility in water is rather slow even at first, but a constant increase of the concentration is observable. The difference in concentration between 32 and 131 days is very small indicating that the point of saturation was practically attained. A definite saturation point, however, has not been reached. Based upon the figure obtained from the last analysis, after 131 days, the solubility may be stated approximately as follows: *1.99 grams of arsenic trioxide are present in 100 Gm. of an aqueous solution, nearly saturated at 25° C.*

Therefore: One gram of arsenic trioxide is soluble in somewhat less than 49.4 cc. (equivalent to 49.3 Gm.) of water at 25° C.

TABLE VI.—RESULTS OF THE SOLUBILITY DETERMINATION OF ARSENIC TRIOXIDE IN WATER AT 25° C.

Stated as Percentage Solute in Solution.

Experiment.	Method of analysis.	Time of preparing solution, days. 27.	30.	36.	131.
Prepared by undersaturation method	Iodometrically	1.439	...	1.901	1.986
		1.446	...	...	...
	Dried at 100° C.	...	1.725	1.923	...
		...	...	...	...

SOLUBILITY IN GLYCERIN.

Solution in this solvent is also slow. The excess solute turned slightly gray after remaining in contact with the solvent for six months. After eight months contact with frequent shaking the solution was kept for several weeks in the rack

to allow subsidence of the excess solute. The solution remained quite strongly opalescent and did not become clear on repeated filtration. It was suspected that part of the solute was suspended in the solution in a finely divided form. This assumption is supported by the high analytical result obtained from this solution. In extrapolating the curve which is obtained on plotting the analytical result after 27 and 93 days and after 3 months, a concentration of nearly 18 per cent is to be expected for a period of 8 months, but the result was 23.37 per cent. This result was not included in the calculation. The concentration found after six months and the extrapolated value for an eight months' period both show no evidence to represent saturation, but they are evidently very close to this point. They illustrate the slow solution of arsenic trioxide in glycerin.

TABLE VII.—RESULTS OF THE SOLUBILITY DETERMINATION OF ARSENIC TRIOXIDE IN GLYCERIN AT 25° C.

Stated as Percentage of Solute in Solution.

	Time of preparing solution.			
	Days.		Months.	
Experiment.	27.	39.	6.	8.
Prepared by undersaturation method	10.18	13.95	16.88	23.39
	10.21	13.70	15.89	23.32
	...	13.62	...	23.42
	...	13.67	...	...

The solubility may be approximately stated as follows: *15.88 grams of arsenic trioxide are present in 100 Gm. of a glycerin solution nearly saturated at 25° C. Therefore: One gram of arsenic trioxide is soluble in somewhat less than 3.9 cc. (equivalent to 4.8 Gm.) of glycerin*[1] *at 25° C.*

THE QUANTITATIVE DETERMINATION OF SODIUM.

In determining the sodium content of a salt or a solution the method of Barber and Kolthoff[2] was applied. This method is based upon the precipitation of sodium as sodium-zinc-uranyl acetate. The reagent is made up from two solutions, *A* and *B*. Solution *A* contains 10 Gm. of uranyl, acetate dihydrate, 6 Gm. of a 30 per cent acetic acid, and sufficient water to make 65 Gm. Solution *B* contains 30 Gm. of zinc acetate trihydrate, 3 Gm. of a 30 per cent acetic acid, and sufficient water to make 65 Gm. The chemicals are dissolved in the solvents with the aid of heat, the solutions then mixed and allowed to stand for 24 hours, and finally filtered.

The solutions to be analyzed should contain not more than 8 mg. of Na in 1 cc. To effect complete precipitation of the sodium, 10 cc. of reagent is added to each cc. of the solution, and the mixture allowed to stand for half an hour. In the case of glycerin a longer time is required as is shown subsequently. The precipitate is collected on a pledget of cotton[3] in a "cup funnel"[4] attached to a suction

[1] The glycerin was the same sample used in the solubility determination of sodium sulphate.

[2] *Jour. Am. Chem. Soc.*, 50 (1928), 1625.

[3] The previous treatment of the cotton with the reagent and the washing solutions in the order followed in washing the precipitate, was found to be necessary, for the weight of the cotton increased by about 5 per cent, evidently by absorption of reagent. Alundum-crucible filters are suggested to overcome this trouble.

[4] For description of the "cup funnel" see under "Sulphate Determination," *loc. cit.*, 766.

pump, washed five to ten times with 2-cc. portions of the reagent then with 95 per cent alcohol previously saturated with sodium-zinc-uranyl acetate. Finally the alcohol is removed by washing with ether and the precipitate dried by drawing air through the funnel. The precipitate is weighed after standing for ten minutes in the balance case.

One milligram of sodium yields 66.88 mg. of sodium-zinc-uranyl acetate. The weight of the precipitate, multiplied by 0.01495 (= (1/66.88)) represents the quantity of sodium (Na) present.

In analyzing the solution resulting from the determination of the solubility of sodium sulphate in glycerin it was found, that the sodium-zinc-uranyl acetate was not completely precipitated after standing for half an hour. Glycerin evidently retards the precipitations. The following data illustrate the retarding effect of a 20 per cent aqueous glycerin:

Time in minutes.	30	40	45	80	180
Gm. of precipitate obtained from equal amounts of solution	0.1823	0.1899	0.1909	0.1914	0.2010 0.2007

COMMENTS ON THE U. S. P. X TEST FOR RHAPONTIC RHUBARB.*

BY R. A. KONNERTH AND R. E. SCHOETZOW.

A lot of Rhubarb which macroscopically closely resembled the Rhapontic variety recently was brought to our attention.

The U. S. P. X test for Rhapontic Rhubarb was applied with negative results. The same determination was made on a sample of true Rhapontic Rhubarb and much to our surprise this also failed to produce a positive reaction.

The German Pharmacopœia was then consulted and by following the technic therein described, crystalline precipitations were obtained in the Rhapontic as well as in the sample under examination.

We wish to point out that the U. S. P. X test for Rhapontic Rhubarb is not reliable.

The U. S. P. sets a time limit of 24 hours. We found that by the U. S. P. X test, Rhapontic Rhubarb requires more than 24 hours for the crystallization of Rhaponticin. Under certain conditions no crystallization occurs. The container in which the test is set aside for observation should be described since the reaction may be overlooked if allowed to take place in a separatory funnel. Crystallization is more readily detected when the test is run in a (1 x 8″) test-tube.

We urgently recommend the U. S. P. adoption of the method given in the German Pharmacopœia: "Deutsches Arzneibuch," 6 Ausgabe (1926), 584.

Below are given the two methods for the detection of Rhapontic Rhubarb as outlined in their respective pharmacopœias:

GERMAN PHARMACOPŒIA.

Five grams of powdered Rhubarb are refluxed on the steam bath for 15 minutes with 22 cc. alcohol (68% vol.), filter to exhaustion and wash residue with 22 cc. hot alcohol (68% vol.).

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

Collect the filtrates and evaporate in a tared evaporating dish to 3–4 Gm. While warm transfer the residue to a strong test-tube, cool and add 5 Gm. ether. Stopper with a cork. Shake thoroughly and set aside. No needle-shaped crystals should form in the ether or on the walls of the test-tube, even after standing several days.

U. S. PHARMACOPŒIA X.

Boil 10 Gm. of powdered Rhubarb for fifteen minutes with 50 cc. of diluted alcohol under a reflux condenser, filter and concentrate to 10 cc. Cool, shake with 15 cc. of ether, and set aside for twenty-four hours: Yellowish, prismatic crystals should not form (Rhapontic Rhubarb).

ANALYTICAL DEPARTMENT OF THE BROOKLYN LABORATORIES,
E. R. SQUIBB & SONS.

BIOASSAY OF CAPSICUMS AND CHILLIES I.*

BY JAMES C. MUNCH.[1]

Capsicum is defined in U. S. Pharmacopœia X (31) as "the dried ripe fruit of *Capsicum frutescens* Linné (*Fam. Solanaceæ*), grown in Africa." In addition to the commercial varieties imported from Africa, under the trade names Zanzibar, Mombassa and Sierra Leone, a number of other species have been developed in Japan and India, the United States and Mexico. Capsicum is used internally as a condiment and carminative and externally as a counterirritant (23).

A number of products have been isolated from capsicum and believed to be the active principles. Heydenreich (7) reported, in 1858, that two oily, non-crystallizable substances differing in alcohol solubility were the active constituents. The sharp tasting principle was designated "capsicin" by Bucholz (2) and by Landerer (8), but this name has been applied to the ethereal extract (3), as well as to the alcoholic extract (30). Buchheim (1) claimed, in 1873, that a dark red oil was the pungent principle. Three years later Thresh (28) stated that the active principle was "capsaicin," which is apparently identical with a product "capsicutin" isolated by Morbitz (12). Micko (11), Meyer (10) and Strohmer (27) established that the crystalline constituent, "capsaicin," was the active pungent and irritant principle. Micko announced the formula to be $C_{18}H_{28}NO_3$, but Nelson in a series of papers (13, 14, 15, 16) reports his experiences in isolating crystalline capsaicin and determining its structure. He obtained 50 Gm. of recrystallized capsaicin from 50 pounds of cayenne pepper. Study with this material showed that it was methyl-nonenyl-vanillyl-amide, with the formula $C_{18}H_{27}NO_3$. He synthesized a number of pungent substances of similar composition.

According to various authors (3, 29) the capsaicin content of various species of capsicum ranges from 0.01 per cent to 0.07 per cent or higher. Micko reports that *C. fastigiatum* contains twenty times as much capsaicin as *C. annum* (29). Morbitz (12) stated that *C. fastigiatum* contains 0.05 to 0.07 per cent of capsaicin.

---

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

[1] Grateful acknowledgment is made to H. H. Crosbie for pharmacognostic identification of the products used in this investigation; to C. Jelleff Carr for the preparation of some of the solutions tested; and, finally, to the 100 collaborators who tested weird drinks in connection with this investigation.

From the details given in their reports it appears that these figures represent the yield of material obtained by the method employed and may be much less than the true capsaicin content.

No chemical method for the determination of capsaicin in capsicum has been quantitatively satisfactory. Chemical methods for the detection of capsicum in food or drug products have not given satisfactory results. Methods for the detection of capsicum in ginger ale were developed by LaWall (9) and by Nelson (13), which were essentially identical in principle. The ether extract was saponified with alcoholic KOH, the residual solution acidified and extracted with ether. Evaporation of the ether left capsaicin which gave a sharp taste on the tip of the tongue. Stary (24) showed that the sharp taste of paprika, pepper and ginger is due to simulation of the endings of the heat nerves in the tongue. Heubner (6) tested irritants upon the corneal nerves and by their power to cause local reaction and vesication on the skin. He found that the pepper products were purely nerve poisons and did not cause dilatation of the blood vessels.

When chemical methods were found to be inadequate attention was directed toward the possibility of developing physiological methods for standardization. The irritant effect upon the skin did not lend itself readily to quantitative results, so attention was directed to the possibility of organoleptic assay. A quantitative test and standard were first published, so far as I can learn, by Scoville (21) in 1912, although he has informed me that he was not the first to test capsicum by taste (22). His original method was to macerate one grain of ground capsicum over night with 100 cc. of alcohol, filter and dilute with sweetened water to the proportion just giving a distinct weak pungency on the tongue. No relation was found between the color or the fat content of oleoresins and the pungency. Tests of commercial materials gave the desired pungency reactions at the following dilutions: Japan chillies, 1:20,000 to 1:30,000 (50 to 30 mg. per L.); Zanzibar capsicum, 1:40,000 to 1:45,000 (25 to 22 mg. per L.); Mombassa, 1:50,000 to 1:100,000 (20 to 10 mg. per L.). Many oleoresins showed pungency at 1:100,000 (10 mg. per L.) although there were some which gave a definite reaction at 1:150,000 (6.7 mg. per L.). He stated that the physiological assay was the only satisfactory method for oleoresin of capsicum.

Gathercoal and Terry (5) made a study of capsicum in connection with the monograph for U. S. Pharmacopœia X, and suggested certain modifications in technic. One cc. of the alcoholic solution from extracting 1 Gm. of ground capsicum with 50 cc. of alcohol is diluted to 250 cc. with distilled water. One cc. of this dilution added to four cc. of 12% sucrose should be as pungent as 5 cc. of 1:10,000,000 capsaicin. Capsaicin at 1:10,000,000 (0.1 mg. per L.), African capsicum at 1:75,000 (13.3 mg. per L.) and piperine at 1:100,000 (10 mg. per L.) are reported to be equally pungent. Their detailed results are given in Table I.

Wirth and Gathercoal (32) concluded that dilution to isopungency gives reliable results. A sample of capsaicin obtained from the Bureau of Chemistry, U. S. Department of Agriculture (Nelson's capsaicin) gave a threshold at 1:10,000,000 (0.1 mg. per L.). Two of a series of five commercial chillies showed thresholds at 1:45,000, one at 1:55,000 and two at 1:70,000 (corresponding to 22, 18 and 14.3 mg. per L., respectively), compared with the U. S. Pharmacopœia standard of 1:70,000 (14.3 mg. per L.).

TABLE I.

Sample no.	Material.	Dilution.	Pungency.	Concentration, mg. per L.
1	Paprika	1:25,000	Distinct	40
		1:50,000	Very slight	20
8	Capsicum, East Indies	1:50,000	Plainly perceptible	20
3	Capsicum, East Indies	1:75,000	Very decided	13
15	Capsicum, Japanese	1:50,000	Plainly perceptible	20
16	Capsicum, Japanese	1:50,000	Plainly perceptible	20
11	Capsicum, West African	1:50,000	Hot	20
		1:75,000	Decided	13
12	Capsicum, Zanzibar	1:75,000	Decided	13
13	Capsicum, Mombassa	1:75,000	Decided	13
	Piperine	1:50,000	Hot	20
		1:100,000	Decided	10
	Capsaicin	1:1,000,000	Very pungent, burning	1
		1:10,000,000	Decided	0.1

In a personal communication (22) Dr. Scoville informs me that individuals will differ greatly in susceptibility and that the daily variations of the same individual are often marked. He required a positive reaction from four out of five men before passing any product. He also points out that the liquid should be allowed to trickle down the throat or swallowed slowly, and not gulped down, to give most satisfactory results. Some capsicums produced a tingle at once which quickly disappeared, whereas others develop their effects more slowly and the pungency persists. The African chillies are usually more pungent. Samples showing reactions at 1:100,000 (10 mg. per L.) are not uncommon and little trouble is had in securing a 1:70,000 capsicum.

DuMez (3) reports a somewhat different method for the physiological evaluation of oleoresin of capsicum. One drop is heated on a water bath with 5 cc. of normal KOH and then diluted to 100 cc. with water. Five cc. of this aqueous solution is placed in a 1000-cc. glass-stoppered, graduated cylinder and diluted with successive 100-cc. portions of water, the dilution being tasted after each addition. The highest dilution giving a distinctly perceptible pungent taste is determined and compared with results obtained on a standard preparation. All of the samples prepared by DuMez were distinctly pungent in dilutions of 1:250,000 (4 mg. per L.). He suggests a standard of 1:200,000 for the oleoresin (5 mg. per L.), stating that the standard of 1:150,000 (6.7 mg. per L.) was rather low.

Wasicky and Klein (33) attempted to develop a quantitative method by applying one drop of a hydro-alcoholic solution of capsaicin, or an alcoholic extract of crude capsicum to the tip of the tongue. They found that the threshold of capsaicin was 1:1,923,076; for the thirty-five crude drugs examined, the thresholds range from 1:263 to 1:13,510, corresponding to capsaicin content from 0.013 per cent to 0.70 per cent, respectively.

A number of qualitative investigations have been made in an effort to connect some definite chemical structure with pungency. Products have been tasted in pure form, in aqueous or alcoholic solution, or ground with flour. Crystalline piperine has been reported to have only a slightly sharp taste, whereas the alcoholic solution has a very sharp taste (17, 18, 19, 25, 26). Riccomanni (20) has shown that the piperidine nucleus is not necessary as a number of methyl

ketones, including phenyl-methyl ketone, have characteristic sharp or pungent tastes. Of the various materials which are reported to be pungent piperine has been found to resemble the pungency of capsaicin most closely, and appeared most suitable for use as a standard.

STUDIES OF U. S. PHARMACOPŒIA METHOD.

The biossay method outlined in U. S. Pharmacopœia X is as follows:

Mix well 1 Gm. of powdered (*a*) capsicum in 50 cc. of alcohol (*b*) in a stoppered flask and macerate for twenty-four hours. (*c*) Dilute 0.1 cc. of the clear, supernatant liquid with 140 cc. of distilled water containing 10 per cent sucrose (*d*, *e*): 5 cc. of this dilution swallowed at once will produce a distinct sensation of pungency of capsicum in the throat of at least two out of three individuals (*f*).

Two-tenths gram of oleoresin and 10 cc. of tincture of capsicum are substituted for 1 Gm. of powdered capsicum in the respective tests, the other details being the same.

Specific attention has been directed to various details of this method as indicated by the letters in parenthesis inserted in the foregoing description. As a result of these investigations a modified method has been developed which has been very satisfactory in the study of pungency.

(*a*) The official method does not specify the fineness of the powdered capsicum. Because of difficulties in grinding uniformly I have performed experiments on only two sizes—the coarse powder (No. 20) and the moderately coarse powder (No. 40). No difference in pungency was found between these two sizes. It is recommended that capsicum in coarse powder be specified for this test.

(*b*) The official method specifies extraction with alcohol which means a solvent containing about 95% of ethanol by volume. In a series of tests upon four preparations parallel experiments were conducted using 95% and 48% alcohol and no difference in pungency was found. The use of 95% alcohol gives a clearer solution and it was felt that it might be preferable. Accordingly the use of 95% alcohol is recommended.

(*c*) Judging by the rate at which the coloring matters were extracted from capsicum and the fact that capsaicin is readily soluble in alcohol, it was believed that the time of maceration specified as twenty-four hours in the official method might be shortened. Accordingly, a series of experiments were undertaken in which the period of maceration was three, six, eighteen, twenty-four hours, and two and three days. The same pungency was found in all samples at the end of three hours as at the end of longer periods of extraction. (See Table II.) In some experiments complete extraction was obtained in less than three hours but in others the result after one hour was somewhat lower than at the end of the three-hour period. It is recommended that the time limit in the official method be shortened to three hours.

(*d*) The official method obtains the extractives of one Gm. of powdered capsicum in 50 cc. of alcohol and dilutes 0.1 cc. of this liquid, representing 2 mg. of crude drug, with 140 cc. of 10% sucrose solution. This gives a final dilution representing 14.3 mg. of crude drug per L., a value not suited for direct mathematical comparison. Glass-stoppered apparatus having a capacity of 140 cc. is not readily available. In this investigation all dilutions were made in glass-stoppered 100-cc. volumetric flasks or graduated cylinders. The alcoholic extract was made to represent 20 mg. of crude drug per cc. Since the final dilutions were made up to 100 cc. the results obtained were very easily translated into milligrams per liter by multiplying the volume of alcoholic extract taken by the quantity 10×20, or 200. A simple calculation gives results in other terminology. Expression of values in terms of milligrams per liter appeared preferable as being more readily understood and more suited for comparison of different samples of crude drugs as well as in comparing the pungency of galenicals.

(*e*) The use of 10% sucrose solution as a diluent is specified in the official method. A series of experiments were undertaken in which 5%, 7.5%, 10% and 15% sucrose solutions were

used. It was found that the same degree of pungency was obtained irrespective of the concentration of sucrose employed, but that smaller differences in concentration could be detected in 10% sucrose than in any of the others. It is recommended that the final dilutions be made in 10% sucrose solution.

(*f*) The official method prescribes that 5 cc. of this dilution will cause a distinct sensation of pungency in the throat of at least two out of three individuals. This is not a very definite standard since by proper selection of individuals widely divergent results may be obtained on a quantitative basis. It may be satisfactory for a qualitative test and will serve to reject material which is greatly under strength. However, the great variation between different individuals and in the same individual at different times makes it advisable to use a definite standard to determine the threshold sensitivity of the humans on test. Attention was directed toward several substances as possible standards. It was found that crude capsicum changes in pungency with age and accordingly it was dismissed. The variation in potency of commercial oleoresins was too large to recommend the indiscriminate use of an oleoresin. Through the kindness of E. K. Nelson a sample of capsaicin was obtained. The results obtained in testing this sample are reported later in this paper. This would serve as a very suitable standard if adequate supplies could be obtained. However, it is very scarce and too difficult to obtain in sufficient quantity to be recommended as a primary standard of reference.

After several other substances had been tested and rejected for one reason or another it was found that commercial piperine met the requirements. A sample of piperine which had precipitated from oleoresin of black pepper was recrystallized once and twice from acetone. Another sample was purchased upon the open market. The melting points of the original samples were 134° to 135° C. After one recrystallization the melting point had fallen to 132° and after a second recrystallization to 129°. (The literature specifies 129° to 130° C.) Alcoholic solutions of all four samples were found to have the same degree of pungency. Fifteen mg. per L. failed to show any pungency, and 16 mg. per L. showed distinct and definite pungency upon ten individuals. Accordingly, it is recommended that piperine be adopted as the standard for determining the threshold of individuals testing the pungency of capsicum and its preparations. It is recommended that 16 mg. per L. be selected as the threshold concentration. In case a stronger concentration is required to produce the minimum degree of pungency selected as a satisfactory end-point, corresponding changes should be made in the thresholds for crude capsicum and for its preparations. This should be done in the same way that changes are made in the assay of the digitalis group when ouabain is employed for standardizing frogs.

Based upon the results obtained in this investigation the following procedure is suggested for the bioassay of capsicum.

> Shake 1 Gm. of coarsely powdered capsicum with 50 cc. of alcohol in a stoppered flask for 3 hours. Dilute 0.1 cc. of the clear, supernatant liquid with 100 cc. of 10% sucrose solution. Five cc. of this dilution swallowed during 5 seconds will produce the same degree of pungency in the throat as 5 cc. of 10% sucrose solution containing 16 mg. of piperine per L. In case 16 mg. of piperine per L. does not produce satisfactory pungency, the threshold concentration should be determined and corresponding alterations made in the standard for capsicum (0.1 cc. per 100 cc. or 20 mg. per L.).

BIOASSAY OF CAPSICUM.

Using this modified method the threshold concentration of a number of capsicums just causing definite pungency in the throat of the author and of ten collaborators have been determined. Results are given in Table II.

TABLE II.

PUNGENCY OF CAPSICUM.

PA no.	Product.	Extraction Concn. Alcohol.	Time.	Minimum effective conc., Mg. per L.
480	Zanzibar	95%	24 hrs.	20
481	Sierra Leone	95%	24 hrs.	20
695	Sierra Leone	95%	24 hrs.	30
496	Annuum	48%	24 hrs.	30
499	Annuum	95%	24 hrs.	30
692	Japan Chillies	95%	1 hr.	30
692	Japan Chillies	95%	3 hrs.	30
692	Japan Chillies	95%	6 hrs.	30
692	Japan Chillies	95%	24 hrs.	30
688	Louisiana sports	95%	24 hrs.	200
689	Louisiana longs	95%	24 hrs.	400
687	Tobasco	95%	24 hrs.	100
682	Short Bombay	95%	24 hrs.	100
683	Long Bombay	95%	24 hrs.	140
649	Commercial sample No. 1	95%	3 hrs.	30
			24 hrs.	30
			2 days	30
650	Commercial sample No. 2	95%	3 hrs.	20
			24 hrs.	20
			2 days	20
651	Commercial sample No. 3	95%	3 hrs.	60
			24 hrs.	60
			2 days	60

The data on Japan chillies and on the three commercial samples are reported to show that extraction is complete within three hours if not sooner. The products reported in this table, with the exception of the last three, were obtained in a whole unground condition through regular drug channels. The last three products (PA 649, 650, 651) were submitted by three drug brokers in response to orders for "ground capsicum U. S. P." Sample No. 3 was vivid red in color, the other two orange-brown. Analyses upon a number of other samples not included in this table suggest that capsicum may be obtained giving a definite pungency in alcoholic extracts at a concentration representing 20 mg. per L. No crude sample has ever been obtained which is more pungent. Consequently, it is recommended that 20 mg. per L. be specified as the standard of pungency for U. S. Pharmacopœia capsicum.

BIOASSAY OF OLEORESIN OF CAPSICUM.

The U. S. Pharmacopœia X specifies that 0.2 Gm. of oleoresin of capsicum shows the same pungency as 1 Gm. of the crude drug. Since the specific gravity at 25° C. is about 0.925 (3) the desired volume of oleoresin was measured in a 1-cc. Mohr pipette. A series of oleoresins were obtained which had been manufactured by the usual commercial procedure and stored in 1-drachm bottles in the dark at room temperature. A series of commercial oleoresins were purchased on the open market under the specification that they should conform with U. S. Pharmacopœia X requirements. Oleoresins of several non-official varieties were prepared by C. Jelleff Carr following the method outlined in U. S. Pharmacopœia X. The pungency of these samples is reported in Table III.

TABLE III.

PUNGENCY OF OLEORESINS OF CAPSICUM.

PA no.	Product.	Minimum effective concentration, mg. per L.	Remarks.
680	Stock sample	3.5	4 mo. old when assayed
674	Stock sample	3.5	5
679	Stock sample	3.0	6
678	Stock sample	3.5	9
677	Stock sample	3.5	11
676	Stock sample	3.5	24
675	Stock sample	3.5	27
686	Stock sample	3.5	$18^1/_2$ years
670	Commercial sample No. 1	7.0	U. S. P. VIII
671	Commercial sample No. 2	10.0	U. S. P. VIII
672	Commercial sample No. 3	3.5	
673	Commercial sample No. 4	5.0	U. S. P. X
690	Japan chillies	20.0	
723	Louisiana sports	12.0	

According to manufacturing records, the yield of oleoresin PA No. 679 was about 20% lower than the yields of the other samples. It is interesting to note that this sample is about 20% stronger than the others. The fact that the same degree of pungency was noted in all of the stock samples, even Sample PA No. 686 which was $18^1/_2$ years old, demonstrates that the pungent principle does not deteriorate with age.

The variability of commercial samples is remarkable. Commercial samples Nos. 1 and 2 were labeled "U. S. P. VIII," in which acetone is specified as the solvent instead of ether. The pungency of oleoresins extracted from the same lot of capsicum by various solvents is now under investigation. Results to date have not indicated that acetone is inferior to ether as a solvent. Oleoresins from the nonofficial varieties were much less pungent.

The U. S. Pharmacopœia requirement of standard pungency is 3.5 mg. per L. From the results obtained in this investigation no change in this standard seems warranted.

PUNGENCY OF TINCTURES AND FLUIDEXTRACTS.

One sample of tincture and one of fluidextract were tested. The minimum effective concentrations were found to be 0.25 and 0.025 cc. per L., respectively. An effort was made to determine the capsicum content of a fluidextract of capsicum and myrrh, but the myrrh disguised the characteristic pungency, making determination of the end-point difficult.

PUNGENCY OF CAPSICUM SEED.

It is believed that the fixed oil resides in the seed, the volatile oil and capsaicin in the tissues. If there is no pungency in the seed they would serve solely as diluents. Seed from Sierra Leone, *Annuum* and *Japan* chillies were carefully separated from the tissue by hand and extracted with alcohol or ether; 200, 100 and 1000 mg. per L., respectively, failed to show evidence of pungency. Since the official oleoresin had a pungency of 3.5 mg. per L. it is believed that any slight

pungency found was due to mechanically present capsicum tissue and that the seeds themselves are not pungent.

PUNGENCY OF CAPSAICIN.

Through the kindness of E. K. Nelson, a sample of chemically pure capsaicin was obtained for this investigation. It was dissolved in 95% alcohol to furnish a stock solution containing one mg. per cc. This solution was stored in a glass-stoppered flask and small portions removed and diluted with 10% sucrose solution immediately before tasting. In each experiment several dilutions of capsaicin were prepared. Five cc. of the weakest solution was given to each member of the test group first. In case a definite pungency was reported no further tests were made for ten to fifteen minutes. In case no pungency was detected each tester rinsed the mouth, swallowed about 15 cc. of water, and a stronger concentration was administered. This was repeated until a definite reaction was obtained. Thereafter, several further tests were conducted in which the tester did not know the relative strengths of the solutions given. This was done in order to prevent bias.

Tests have been made upon a total of ninety-four different individuals. Some of this group were pharmacy students from two schools of pharmacy, others were nurses from two schools of nursing. The remainder of the group consisted of chemists, clerks, stenographers and factory employees. Some of the group had had a long experience in drug manufacture whereas others were inexperienced. By administering a non-pungent solution first the lower limit of detectile pungency was sought without fatiguing the taste perceptions.

The degree of response was estimated. No detectible pungency was reported as zero. A just distinctly perceptible pungency was reported as one plus. As the intensity of pungency increased the reactions were grouped as two plus, three plus and four plus which was taken as the maximal effect. The number of individuals giving different degrees of reaction to various doses are recorded in Table IV.

TABLE IV.

PUNGENCY OF CAPSAICIN TO INDIVIDUALS.

Degree of pungency.	Concentration of capsaicin—mg. per L.									
	0.075	0.10	0.125	0.13	0.16	0.175	0.25	1.0	1.25	2.5
0	21	47	3	0	0	0	1	..	..	..
1 plus	..	47	12	2	2	1	5	3	1	..
2 plus	..	..	1	..	..	1	8	5	..	3
3 plus	..	..	..	..	..	..	2	5	..	1
4 plus	..	..	..	..	..	..	..	..	..	6
Total	21	94	16	2	2	2	16	13	1	10

The results given in Table IV show that there is a great variation in relative susceptibility. In no instance did a concentration of 0.075 mg. per L. cause a definite reaction for pungency. At 0.10 mg. per L. just one-half of the test subjects gave a positive response. It is estimated that 0.1125 mg. per L. will cause a positive reaction in 2 of 3 individuals. A concentration of 0.25 mg. per L. failed to cause any perception of pungency in only one instance. With the exception of this particular individual a concentration of 0.13 mg. per L. or above always

caused a reaction of one plus or more. The results obtained as a single plus reaction in terms of per cent of individuals tested is shown in Fig. 1. The results are approximately in agreement with a straight line having equation-Y equals $(X-0.075)/(0.00055)$, in which X represents the concentration of capsaicin in mg. per L. and Y the percentage of one-plus reactions to be expected. An increase of 0.011 mg. per L. would cause an increase of 20% in positive reactions.

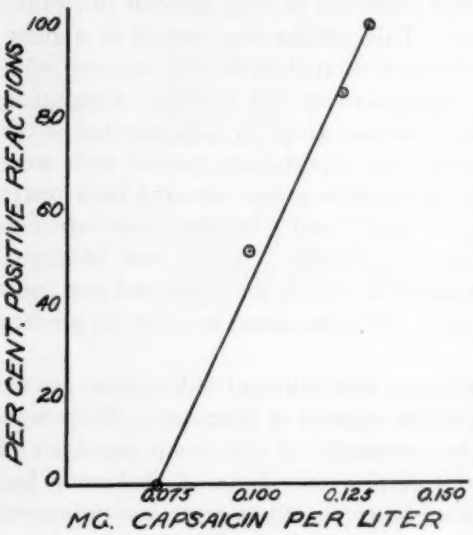


Fig. 1.

When the correlation between the concentration of capsaicin and the percentage of positive reactions is determined by the usual statistical methods (4), the correlation coefficient, r, is found to be plus 0.65, with a probable error of 0.04. These results indicate that there is a definite positive correlation between taste and dosage, and that this relationship is linear. Since this is true it becomes quite feasible to standardize individuals in terms of capsaicin, if it were available. A series of tests upon the same group of ten individuals over several months showed fairly uniform responses. There were occasional daily variations which at times amounted to 10 to 20 per cent, but in general no change in threshold was noted.

No mention is made in the official method as modified regarding the interval which should elapse between successive tests. In three individuals showing a one-plus reaction to a concentration of 0.10 mg. of capsaicin per L., 5-cc. quantities of solution were swallowed at short intervals, as indicated in Table V. The degrees of response were found to be somewhat greater on the second than on the original test; thereafter the original degree of response was always produced.

TABLE V.

REPETITIVE RESPONSE TO CAPSAICIN.

Seconds after first test.	Subject. A.	B.	C.	Seconds after first test.	Subject. A	B.	C.
0	1	1	1	75	1	.	.
15	2	2	.	90	1	.	.
30	1	1	.	100	1	.	.
45	1	1	.	120	1	1	.
60	1	1	2	135	.	1	.

A series of tests were conducted upon eight subjects showing a one-plus reaction to 0.10 mg. of capsaicin per L. in a 10 per cent sucrose solution. The same concentrations were administered in a 5 per cent, and in a 7.5 per cent sucrose solution. The apparent pungency was slightly weaker in the 5 and 7.5 per cent solutions as compared with the response in the 10 per cent solution, but eventually the same degrees of response were obtained.

CONCLUSIONS.

1. Several modifications are suggested for the bioassay of capsicum and its products outlined in U. S. Pharmacopœia X.

2. A concentration of 0.10 mg. of capsaicin per L. in 10 per cent sucrose solution caused a definite sensation of pungency in the throats of half of ninety-four individuals tested, and 0.13 mg. per L. in the throats of all individuals.

3. Definite linear correlation has been found between concentration and percentage of positive reactions to capsaicin (r equals 0.64 ± 0.04).

4. Using the modified method a number of official and unofficial capsicums, oleoresins and galenicals have been assayed. Great variability in commercial products has been found.

5. An oleoresin of capsicum $18^1/_2$ years old was as pungent as a freshly-prepared sample.

6. Need is pointed out for a definite standard by means of which individuals may standardize their pungency perceptions. Capsaicin would be very good but is not available in adequate quantities. Piperine has been found suitable and is recommended for this purpose.

7. As standards of pungency it is recommended that 20 mg. per L. of capsicum, or 3.5 mg. per L. of oleoresin of capsicum should produce the same degree of pungency as 16 mg. per L. of piperine, all solutions to represent alcoholic solutions and to be diluted with ten per cent sucrose solution.

8. Solutions differing by 10 per cent in pungency have been readily distinguished.

BIBLIOGRAPHY.

(1) Buchheim, *Vierteljahrschr. prakt. Pharm.*, 4 (1872), 507; through DuMez, page 121.

(2) Bucholz, *Raschenb. Scheidkuenst. Apoth.*, 37 (1816), 1; through DuMez, page 122.

(3) Andrew G. DuMez, "A Century of the United States Pharmacopœia, 1820–1920. I.—The Galenical Oleoresins," Inaug. Dissert. (1917), published as serial No. 980, *Bulletin* of the University of Wisconsin.

(4) W. Palin Elderton, "Frequency-Curves and Correlation" (1906).

(5) E. N. Gathercoal and R. E. Terry, "The Capsicum Monograph in U. S. P. X," JOUR. A. PH. A., 10 (1921), 423–428.

(6) W. Heubner, "Pharmacology of Irritating Substances," *Arch. exptl. Path. Pharmakol.*, 107 (1925), 129–154; through *Chem. Abstr.*, 19 (1925), 3325.

(7) F. Victor Heydenreich, "Active Principle of Capsicum," *Am. J. Pharm.* (July 1858); through PROC. A. PH. A., 7 (1858), 58.

(8) Landerer, *Vierteljahrschr. prakt. Pharm.*, 3 (1854), 34; through DuMez, page 122.

(9) Charles H. LaWall, "A Method for the Detection of Small Quantities of Capsicum in Ginger Ale and Other Preparations of Ginger," *Am. J. Pharm.*, 81 (1909), 218–219.

(10) A. Meyer, *Pharm. Zeit.* (1889), 130; through Tschirch, page 867.

(11) Micko, *Zeitschr. Nahr. Genussm.*, 1 (1898), 818; 2 (1899), 411; through Nelson, page 1115.

(12) Morbitz, *Pharm. Zeitschr. Russland.* (1897), 372; through DuMez, page 124.

(13) E. K. Nelson, "Capsaicin, the Pungent Principle of Capsicum and the Detection of Capsicum," *Ind. & Eng. Chem.*, 2 (1910), 419–421.

(14) *Ibid.*, "The Constitution of Capsaicin, the Pungent Principle of Capsicum," *J. Am. Chem. Soc.*, 41 (1919), 1115–1121.

(15) *Ibid.*, "The Constitution of Capsaicin, the Pungent Principle of Capsicum. II," *J. Am. Chem. Soc.*, 42 (1920), 597–599.

(16) E. K. Nelson and L. E. Dawson, "Constitution of Capsaicin, the Pungent Principle of Capsicum. III," *Ibid.*, 45 (1923), 2179–2181.

(17) Erwin Ott and Kurt Zimmermann, "Natural and Artificial Pepper Substances and the Relation between Chemical Constitution and Pepper Taste," *Ann.*, 425 (1921), 314–337; through *Chem. Abstr.*, 16 (1922), 1229.

(18) Erwin Ott and Fritz Eichler, "Natural and Artificial Pepper Substances. II. The Chavicin of Pepper Resin, the Especially Active Constituent of Black Pepper," *Ber.*, 55B (1922), 2653–2663; through *Chem. Abstr.*, 17 (1923), 1024.

(19) H. Rheinboldt, "The Pepper Taste of Piperine," *Ibid.*, 56B (1923), 1228–1229; through *Chem. Abstr.*, 17 (1923), 3189.

(20) C. Riccomanni, "Relations between Chemical Constitution and Taste," *Atti. accad. Lincei*, (5) 33 (1924), 145–158; through *Chem. Abstr.*, 18 (1924), 2900.

(21) W. L. Scoville, "Note on Capsicums," Jour. A. Ph. A., 1 (1912), 453–454.

(22) W. L. Scoville, personal communication.

(23) Torald Sollmann, "A Manual of Pharmacology," 3rd Edition (1927), 211.

(24) Z. Stary, "Stimulation of Heat Nerves by Pharmaceutical Substances," *Arch. exptl. Path. Pharmakol.*, 105 (1925), 76–87; through *Chem. Abstr.*, 19 (1925), 1602.

(25) H. Staudinger and H. Schneider, "Relation between Chemical Constitution and Pepper Taste," *Ber.*, 56B (1923), 699–711; through *Chem. Abstr.*, 17 (1923), 2581.

(26) H. Staudinger and F. Müller, "II Aliphatic-Aromatic Acid Piperides," *Ber.*, 56B (1923), 711–715; through *Chem. Abstr.*, 17 (1923), 2582.

(27) Strohmer, *Prager Rundsch.* (1884), 643; through Tschirch, page 867.

(28) Thresh, *Pharm. J. and Trans.* (3), 7 (1876–1877), 21, 259, 473; 8 (1877–1878), 187; through Nelson, page 1115.

(29) A. Tschirch, "Fructus Capsici," Hand. der Pharmakog., 2nd Edition, 3 (1925), 867–878.

(30) John C. Umney, "What Is Capsicin?" *Pharm. J.*, 91 (1914), 594.

(31) "The Pharmacopœia of the United States of America. Tenth Decennial Revision," (1925), page 97.

(32) Elmer H. Wirth and E. N. Gathercoal, "Report of the Scoville Organoleptic Method for the Valuation of Capsicum," Jour. A. Ph. A., 13 (1924), 217–219.

(33) R. Wasicky and F. Klein, "Über die Wertbestimmung von Capsicum," Festschrift für A. Tschirch (1926), 357–361.

ABSTRACT OF DISCUSSION.

W. L. Scoville said that Dr. Munch had added valuable information relative to the test. He asked whether Dr. Munch considered the reaction on the tongue as well as on the throat. He also asked whether piperine gave the same pungency on the throat as on the tongue. He had found variation in individuals not only personally, but at different times; he had tried the test on five different men, when they agree no further test is made; but if not, the test is tried on others. He had noticed that his own sensitiveness varied. If the test sample is quickly swallowed the results are not satisfactory. Referring to the skin test, he said that the response comes slowly and the individual, if busy with work, is apt to overlook the reaction. Sometimes the reaction comes and goes quickly. As a scientific test he did not consider the test as satisfactory as some others, but if practical application could be made of the test there was no reason for not making use of it.

James C. Munch replied he was endeavoring to make the method more quantitative so as to employ it in research work on capsicum, echinacea and other drugs. If cantharides is being tested there is no forgetting a definite amount on the skin will give a definite reaction.

He had been taking a reaction obtained on the throat within one minute as positive and ignoring the effects on the tongue; responses on the tongue result from stimulation of another nerve than that of the throat. He said that a man in the laboratory with him required ten times as much capsicum as he did and he also required ten times as much piperine. He recommended piperine or capsaicin for standardizing the individual.

In applying the test, 5 cc. of it, in five seconds, are allowed to trickle down the throat at a moderately slow rate.

QUANTITATIVE ANALYTICAL METHODS FOR THE STUDY OF PEROXIDE FORMATION IN ETHER.*

BY R. VAN WINKLE AND W. G. CHRISTIANSEN.

During the many years devoted to ether research by our laboratories extensive work has been carried out in the development of quantitative analytical procedure which could be relied upon to give quick and accurate results. The work has been carried on by various investigators[1] and the procedures given in this paper are the final approved technique which to date under innumerable different conditions have met with no objection.

DETERMINATION OF ACTIVE (PEROXIDE) OXYGEN IN ETHER.

The basis of our method is an application of the U. S. P. peroxide test and the fact that the peroxides in ether decompose in an acid medium to hydrogen peroxide. The latter reacts quantitatively with a soluble iodide and the free iodine liberated is titrated with standard thiosulphate in a solvent miscible with both ether and water, namely, alcohol. Starch cannot be used as an indicator and consequently the end-point is a change from the yellow iodine color to a colorless solution. At first this end-point gives some difficulty but to one experienced in this analysis it is quite perceptible.

Method.—A 125-cc. flint glass-stoppered bottle is thoroughly swept out with nitrogen; 50 cc. of 1-1 alcohol and water from which oxygen is removed by evacuation and which has been kept under nitrogen, is added, followed by 10 cc. of the ether to be analyzed. Five cc. of 1-1 hydrochloric acid are added and then 0.25 Gm. of thoroughly dried cadmium potassium iodide. During the addition of the liquid materials a stream of nitrogen is kept playing around the orifice of the bottle. After the addition of the iodide, the bottle is stoppered, thoroughly shaken and placed in a dark closet for one hour. The liberated iodine is then titrated with $N/100$ thiosulphate. For extremely accurate work it is necessary to run a blank on the solvent due to the fact that a small amount of iodine is liberated by the same.

Calculations

$$\frac{\text{Cc. of } N/100 \text{ Thio.} \times 0.0560}{10} = \text{Cc. of Peroxide Oxygen, 1 cc. of Ether}$$

This analytical method is interesting in that it bears a definite relation to the qualitative test for peroxides given in the U. S. Pharmacopœia. The results of over nine hundred ethers analyzed for peroxides by the above test and simultaneously by the U. S. P. peroxide tests have shown that with peroxide values 0.0000 − 0.0022 cc. of peroxide oxygen/cc. of ether, the U. S. P. test is negative. With peroxide values 0.0022 − 0.0028 cc. of peroxide oxygen/cc. of ether, the U. S. P. test is doubtful (that is, in this range the U. S. P. test may be positive or negative). With peroxide values above 0.0028 cc. of peroxide oxygen/cc. of ether the U. S. P. peroxide test was always positive. The analyses on which the above statements

* Scientific Section, A. PH. A., Rapid City meeting, 1929.

[1] The authors wish to make recognition of the pioneer work carried out in the development of these analytical methods by Dr. L. K. Riggs and Mr. H. D. Goulden.

have been based were made by several investigators and the peroxide values varied over a wide range from 0.0000 to 0.0394 cc. of peroxide oxygen/cc. of ether.

In making U. S. P. peroxide tests it was noticed that in ethers whose peroxide content was above 0.0050 cc. of peroxide oxygen/cc. of ether, a white precipitate was observed in the aqueous cadmium potassium iodide portion. We isolated some of this material and on analysis found that it contained 42.16% cadmium and 28.84% iodine. On the basis of our analyses the stoichiometrical ratio of cadmium to iodine is 3 Cd to 2 I.

The formula for cadmium potassium iodide may be written as:

$$CdI_2.{}_2KI$$

In a similar manner the formula for the unknown precipitate may be written:

$$CdI_2.{}_2CdX$$

where X represents an unknown group whose molecular weight is approximately 100. As cadmium is dibasic it was thought that this might be the acetate ion. Experiments failed to confirm the same.

Time has not permitted the authors to investigate this further. We believe, however, the complete determination of this unknown would be of interest to ether chemistry. The fact that it forms only with ethers which have formed considerable peroxide is evidence that it is directly connected with peroxidation of ether. This precipitate offers an easy method for isolating one impurity produced in the deterioration of ether.

NOTE: The above cadmium compound is not explosive.

DETERMINATION OF MOLECULAR (DISSOLVED) OXYGEN IN ETHER.

This analytical procedure is based on a combination of the above test and the Winkler method for determining dissolved oxygen. It has been demonstrated in our work that both the dissolved and active oxygen react with the precipitated manganous hydroxide and on acidification in the presence of iodide an amount of iodine equivalent to both is liberated. Accordingly we determine total oxygen and by subtracting the peroxide oxygen as determined by the previous method, the value for dissolved oxygen is obtained. A 50-cc. sample of ether is used for each analysis. Experience has shown that this is satisfactory for ethers of peroxide value up to 0.0150 cc. of peroxide oxygen/cc. of ether. On ethers of peroxide value higher than the above, it is necessary to take a proportionately smaller sample.

Method—Manganous Sulphate Solution — 48 Gm./100 cc.
Sodium Hydroxide Solution — 40 Gm./100 cc.

A 400-cc. glass-stoppered bottle of known content is thoroughly flushed out with nitrogen; 1-1 oxygen free alcohol-water as described in the above method is allowed to run into the bottle. At the same time fifty cubic centimeters of the ether to be tested is added by means of a pipette previously swept out with nitrogen. During the addition of all the substances up to the point of acidification a stream of nitrogen is played around the orifice of the bottle. Solvent is added until the height of the liquid is just slightly above the neck of the bottle; 2 cc. of the manganous sulphate solution is then added, followed by 2 cc. of the sodium

hydroxide solution. The bottle is then stoppered taking precaution to allow no gas bubble to remain between the stopper and the liquid. The bottle is thoroughly shaken and then allowed to stand several minutes to allow the precipitate to settle out. It is advisable to shake the bottle several times to insure complete reaction of the oxygen with the manganous hydroxide. After settling out of the precipitate, one Gm. of cadmium potassium iodide is added, followed by 10 cc. of concentrated hydrochloric acid. The addition of reagents displaces some of the liquid in the bottles. Due account of this is taken wherever necessary in the calculations. The bottle is then stoppered and shaken until all of the precipitate has dissolved; 10 cc. more of hydrochloric acid is then added, the bottle stoppered, shaken again and then the contents poured into a beaker and titrated with $N/100$ thiosulphate in a manner similar to the titration for peroxide oxygen. In the calculations due account is taken of the ether displaced by the addition of the manganous sulphate and sodium hydroxide and of the iodine displaced by the second 10 cc. of hydrochloric acid. Twenty cc. of acid cannot be added at once due to the fact that it tends to stir up and eject some of the hydroxide precipitate the amount of which cannot be calculated. By liberating the iodine with the first 10 cc., the second 10 cc. displaces a known amount of that iodine which can be taken into account.

Due to the fact that it is not always possible to remove all of the oxygen from the 1-1 alcohol-water solvent, it is necessary to run a blank on the same.

CALCULATIONS.

A model example of the calculations is as follows:

(A) *Blank Determination on Solvent.*

Thiosulphate factor for oxygen	0.0556
Volume of bottle for analyses	414 cc.
Volume to be used for calculating	400 cc.

NOTE: Fourteen cc. deducted equal to the 2 cc. of manganous sulphate, 2 cc. of sodium hydroxide and the second 10-cc. portion of acid. The first 10-cc. portion of acid displaces nothing but solvent as both the dissolved and peroxide oxygen are in the form of the precipitated manganic acid.

Thiosulphate required for titration — 5 cc.

$$\frac{0.0556 \times 5}{400} = 0.00069 \text{ cc. of } O_2\text{/cc. of solvent}$$

(B) *Ether Analysis*—50 cc. sample of ether.

Volume of bottle for analyses	398 cc.
Thiosulphate required for titration	15 cc.

$$\frac{50 \times 100}{398} = 12.6\% \text{ ether in solution}$$

An amount equivalent to 14 cc. is displaced by reagents.

$14 \times 12.6\% = 1.76$ cc. of ether lost by addition of reagents.
$14 - 1.76 = 12.24$ cc. of solvent lost by addition of reagents.
$50 - 1.76 = 48.24$ cc. — true volume of ether.
$348 - 12.24 = 335.76$ cc. true volume of solvent.
$0.0556 \times 15 = 0.8340$ cc. total oxygen.
$335.76 \times 0.00069 = 0.2327$ cc. oxygen due to solvent.

$$\frac{0.8340 - 0.2327}{48.24} = 0.0124 \text{ cc. of dissolved and peroxide oxygen/cc. ether}$$

Peroxide Oxygen by first method in this paper = 0.0030 cc./cc. ether
Dissolved Oxygen = 0.0094 cc./cc. ether

CONCLUSIONS.

1. Quantitative methods have been developed for determining active (peroxide) and molecular (dissolved) oxygen in ether.

2. A relation between this quantitative peroxide test and the U. S. P. qualitative test for peroxides has been determined.

3. The nature of the percipitate formed in the U. S. P. test for peroxides on ethers having developed peroxides is discussed.

RESEARCH DEPT. OF THE CHEMICAL & PHARMACEUTICAL LABORATORIES,
E. R. SQUIBB & SONS, BROOKLYN, NEW YORK.

A FURTHER STUDY OF THE INCOMPATIBILITY BETWEEN SODIUM SALICYLATE AND SODIUM BICARBONATE.*

BY JOHN C. KRANTZ, JR., AND C. JELLEFF CARR.

INTRODUCTION.

In a previous communication to THIS JOURNAL one of the authors[1] in a study of the incompatibility between sodium salicylate and sodium bicarbonate in aqueous solution, showed this particular darkening phenomenon to be peculiar to the sodium salt of ortho hydroxy benzoic acid in the presence of alkali bicarbonates. Since the publication of this work, the investigation of certain English workers[2] along this line has come to our attention. It was claimed by these investigators that the discoloration was due to an impurity in the sodium salicylate.

To determine whether or not this change was inherent to salicylic acid or due to some impurity present and to study the influence of concentration upon the rate of discoloration are the purposes of this investigation.

EXPERIMENTAL.

Influence of Impurity.—A sample of salicylic acid obtained from oil of wintergreen and recrystallized was secured. This product was again recrystallized from hot water. A sample of this acid was converted into sodium salicylate and 60 cc. of a solution prepared containing 2 Gm. each of sodium salicylate and chemically pure sodium bicarbonate.

This solution was stored in flint glass, in a partially filled flask in diffused daylight.

Within three days, slight signs of discoloring were visible, within seven days the solution was dark brown and finally became black as did those samples previously described by one of the authors.

---

* Section on Practical Pharmacy and Dispensing, A. PH. A., Rapid City meeting, 1929.

[1] J. C. Krantz Jr., JOUR. A. PH. A., 17 (1928), 1204.

[2] Anon., *Chem. & Drug.*, 104 (1926), 506; through A. PH. A. YEAR BOOK, 15 (1926), 74.

TABLE I.

No.	Conc. Sodium Salicylate. Molar.	Gm. in 200 cc.	Conc. Sodium Bicarbonate. Molar.	Gm. in 200 cc.	No. of days when discoloration appeared.
1	0.172	5.524	1.00	16.80	5 dark brown
2	0.172	5.524	0.50	8.40	9 dark brown
3	0.172	5.524	0.10	1.68	13 dark brown
4	0.172	5.524	0.01	0.168	30 light brown
5	0.172	5.524	0.001	0.0168	46 very light brown
1	0.344	11.05	0.2	3.36	10 dark brown
2	0.172	5.524	0.2	3.36	14 dark brown
3	0.086	2.762	0.2	3.36	35 dark brown
4	0.0086	0.276	0.2	3.36	35 light brown
5	0.00086	0.028	0.2	3.36	46 no discoloration

Influence of Concentration.—In order to study the influence of concentration upon the rapidity of darkening in this mixture, two series of solutions were prepared. One in which the concentrations of sodium salicylate were kept constant and the concentrations of sodium bicarbonate varied and another in which the concentrations of sodium bicarbonate were kept constant and the concentrations of sodium salicylate varied.

Table I records the observations made upon these solutions stored in partially filled flint flasks in diffused daylight.

The results included in Table I indicate that the rapidity of color change is a function the concentration of either the sodium salicylate or the sodium bicarbonate. The greater the concentration of either, the more rapid will be the change in color.

An analysis of several samples during the formation of and presence of a deep black color indicated that the loss of salicylic acid by this color change is insignificant.

CONCLUSIONS.

1. Purified natural sodium salicylate darkens in aqueous solution in the presence of sodium bicarbonate.

2. The rapidity of the occurrence of the darkening phenomenon is a function of the concentration of either the sodium salicylate or the sodium bicarbonate.

PHARMACEUTICAL RESEARCH LABORATORY,
SHARP AND DOHME, BALTIMORE, MARYLAND.

ABSTRACTS OF SCIENTIFIC PAPERS, 1929.

"The Therapeutic Activity of Neoarsphenamine," by Alfred E. Jurist and W. G. Christiansen.

Some studies on the toxicity and therapeutic index of Neoarsphenamine are presented showing the wide range of variation in this product and the existence of at least one product with a therapeutic index closely approaching that of arsphenamine. Some discussion of the relation between the chemical, physical and colloidal characteristics and therapeutic index of Neoarsphenamine is presented.

"Food as a Preventive Medicine," by E. A. Ruddiman.

Discussion importance properly balanced diet of proteins and carbohydrates. Effect dietary content of vitamins mentioned, also importance of certain minerals.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. E. Cor. Lombard and Greene Sts., Baltimore, Md.

APPARATUS AND MANIPULATIONS.

Bodendorf, Kurt
The normal solutions of the German Pharmacopœia VI
Apoth. Ztg., 44 (1929), 1372

Cocking, T. Tusting
Arsenous iodide and its solutions
Quart. J. Pharm. Pharmacol., 2 (1929), 409

Csipke, Z.
Chemical assay of oleoresin of aspidium
Ber. Ungar. Pharm. Ges. (1929), 457; through *Pharm. Weekbl.*, 66 (1929), 1030

Eschenbrenner, H.
Blaud's Pills
Pharm. Ztg., 74 (1929), 1368

Kroeber, Ludwig
Fluidextract of Calendula
Pharm. Zentralh., 70 (1929), 728

Rae, J.
Loss of ammonia during preparation and storage of Tinctura Quininæ Ammoniata
Pharm. J., 123 (1929), 310

Schoorl, N.
Spirit of camphor
Pharm. Weekbl., 66 (1929), 977

Schousen, Chr.
Fluidextract of frangula
Dansk Tids. Farm. (1929), No. 8; through *J. pharm. Belg.*, 11 (1929), 759

Tellera, Giacomo
Stabilization of hydrogen dioxide solution with nipagin, the methyl ester of *p*-oxybenzoic acid
Boll. chim.-farm., 67 (1928), 577; through *Pharm. Zentralh.*, 70 (1929), 727

Walmsley, J. R.
Total solids of tinctures and their limitations as analytical factors
Pharm. J., 123 (1929), 459

Wokes, Frank
Stability of extracts of ergot
Quart. J. Pharm. Pharmacol., 2 (1929), 384

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS.

Barba-Gosè, J.
Toxicity of different commercial samples of tetraiodo-phenolphthalein sodium
Quart. J. Pharm. Pharmacol., 2 (1929), 396

Burn, J. H., and Grewal, K. G.
Strength of tinctures of strophanthus B. P.
Quart. J. Pharm. Pharmacol., 2 (1929), 404

Csépai, Karl, and Förstner, Béla
Clinical method for standardizing insulin preparations
Endokrinologie, 3 (1929), 412; through *Chem. Abstr.*, 23 (1929), 5272

Cloetta, Max
Biochemical action of digitalis
J. A. M. A., 93 (1929), 1462

Culhane, Kathleen, *et al.*
Physiological assay of insulin
Biochem. J., 23 (1929), 384; through *Chem. Abstr.*, 23 (1929), 5272

Franklin, K. J.
Pharmacology of some compounds allied to strychnine
Quart. J. Pharm. Pharmacol., 2 (1929), 382

Fuehner, H.
Posology of strophanthin
Deut. med. Wochnschr., 55 (1929), 1408; through *Pharm. J.*, 123 (1929), 465

Hamet, Raymond
Pharmacological properties of the alkaloid of Banisteria Caapi
Compt. rend., 188 (1929), 1519; through *Chem. Abstr.*, 23 (1929), 5241

Irons, E. E.
Clinical evaluation of drugs
J. A. M. A., 93 (1929), 1523

Leake, Chauncey D.
Pharmacologic evaluation of new drugs
J. A. M. A., 93 (1929), 1632

Nickel, Allen C.
Tetraiodophenolphthalein as an antiseptic and germicide of the biliary tract
J. Pharmacol. & Exper. Therap., 37 (1929), 359

Rowe, L. W.
Digitalis assay standards
JOUR. A. PH. A., 18 (1929), 1138

Shaw, Wilfred
Observations on the therapeutic value of the œstrus-producing hormone of the ovary
Quart. J. Pharm. Pharmacol., 2 (1929), 373

Swanson, Edward E.
Standardization and stabilization of ergot preparations
JOUR. A. PH. A., 18 (1929), 1127

Thompson, Marvin R.
Pharmacology of ergot
JOUR. A. PH. A., 18 (1929), 1106

Truffi, G.
Depilatory action of thallium acetate
Boll. Soc. ital. Biol. Sper., 3 (1928), 433; through *Chem. Abstr.*, 23 (1929), 2491

ANIMAL AND VEGETABLE DRUGS.

Amelink, F.
Michrochemical identification of Flores Cinæ
Pharm. Weekbl., 66 (1929), 1025

Bourcet, P., and Fourton, A.
The tannin of purple digitalis
Bull. soc. chim., 45 (1929), 776; through *J. Soc. Chem. Ind.*, 48 (1929), 957

Breyer-Brandwijk, Maria G.
Chemistry of the leaves of Solanum Pseudocapsicum
Bull. sci. pharmacol., 36 (1929), 541

Casparis, P.
Constituents of fresh cola nuts
Pharm. Acta Helv., 4 (1929), 181

Chatterji, D. N., and Roy, M. B.
Valuation of Charas
Indian Med. Gaz., 64 (1929), 273; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 419

Giammona, A.
The sugars in glycyrrhiza root
Ann. chim. applicata, 19 (1929), 110; through *Quart. J. Pharm.*, 2 (1929), 334

Gaudard, F.
Silicic acid content of some medicinal plants
Pharm. Acta Helv., 4 (1929), 157

Goester, L. E.
India gum
Pharm. Weekbl., 66 (1929), 1041

Groenhoff, G.
Influence of light on dried pepsin
Pharm. Weekbl., 66 (1929), 986

Janot, Maruice-Marie, and Favre, Charles
Application of iodobismuthic reagent to the assay of conium preparations
Bull. sci. pharmacol., 36 (1929), 529

Junkmann, Karl, and Wiechowski, W.
Active principle of chamomile flowers
Arch. exptl. Path. Pharmakol., 144 (1929), 1; through *Chem. Abstr.*, 23 (1929), 5237

Kariyone, T., *et al.*
Constituents of Prunus Persica
J. Pharm. Soc. Japan, No. 572 (1929), 937

Legrand, Pierre
Comparative study of the assay methods of the various pharmacopœias for pepsin
J. pharm. chim., 10 (1929), 385

Perrot, Em., and François, M.-Th.
African species of chaulmoogra
Bull. sci. pharmacol., 36 (1929), 551

Peyer, W., and Rosenthal K.
Jalap and Scammony and their resins and glucosides
Apoth. Ztg., 44 (1929), 1329

Peyer, W.
Guaiacum resin
Süddeut. Apoth.-Ztg., 69 (1929), 67; through *Pharm. J.*, 123 (1929), 397

Rusby, H. H.
Authentication of materials used in research
Pharm. J., 123 (1929), 312

Svensson, Sven E.
The rhizome of Acorus gramineus Soland
Farm. Revy., 28 (1929), 553

Taylor, T. C., and Walton, R. P.
Characterization of certain starches and their amyloses
J. Am. Chem. Soc., 51 (1929), 3431

ALKALOIDS AND GLUCOSIDES.

Arreguine, V., and Amadeo, F.
Lead tetrachloride as a reagent for alkaloids
Semana méd., 36 (1929), 645; through *Chem. Abstr.*, 23 (1929), 5272

Fulton, Charles C.
Aldehyde-oxidation reactions for phenols, particularly the opium alkaloids
J. A. O. A. C., 12 (1929), 434

Lillig, R., and Kreitmair, H.
New isomer of yohimbine
Merk's Jahresb. (1928), 20; through *J. pharm. Belg.*, 11 (1929), 758

Lortz, E.
Phloroglucotannoide containing drugs and the red color produced by acids
Apoth. Ztg., 44 (1929), 1342

Marañon, J. M.
Alkaloid of Artabotrys suaveolens
Philippine J. Sci., 38 (1929), 259; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 411

Paget, Marcel
Surrenine (epinephrine) and the French Pharmacopœia
J. pharm. chim., 10 (1929), 344
v. Miko, Julius
Macro and microestimation of caffeine in drugs
Pharm. Monatsch. (1929), No. 7; through *J. pharm. Belg.*, 11 (1929), 720
Windaus and Haack
Formula of digitaline
Ber., 62 (1929), 475; through *J. pharm. chim.*, 10 (1929), 368
Zechner, Ludwig
Method for the quantitative determination of arbutin
Pharm. Monatsch., 10 (1929), 194

ESSENTIAL OILS.

Aitken, H. A. A.
Essential oils of Podocarpus totara and P. dacrydiodes
J. Soc. Chem. Ind., 48 (1929), 344 T
Massy, R.
Essential and pyroligneous oils of Cedrus atlantica
Bull. Inst. Pin. (1929), No. 30–31; through *J. Soc. Chem. Ind.*, 48 (1929), 910
Takens, E.
Phenol ether in fennel and star anise oils
Riechstoffind., 4 (1929), 8; through *J. Soc. Chem. Ind.*, 48 (1929), 910

GENERAL AND PHYSICAL CHEMISTRY.

Berg, Richard
Analytical use of ortho-oxyquinoline
Pharm. Ztg., 74 (1929), 1364
Kögan, Gregor
Preparation of litmus paper
Pharm. Zentralh., 70 (1929), 725
Köszegi, D.
New volumetric method for the determination of sulphates
Zeit. anal. Chem., 77 (1929), No. 5–6; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 433
Rosenthaler, L.
Economical drug testing
Pharm. Ztg., 74 (1929), 1351, 1379, 1415, 1432

INORGANIC CHEMICALS.

Korenman, I. M.
Michrochemical reactions of the salts of some heavy metals
Pharm. Zentralh., 70 (1929), 693
Stephenson, J. E., and Bridge, S. W.
Action of air on flowers of sulphur and ground sulphur
Analyst (Oct. 1929), 590; through *Pharm. J.*, 123 (1929), 465

ORGANIC CHEMICALS.

Anon.
Characters and tests for lactose in the New Roumanian Pharmacopœia
Pharm. Monatsch., 10 (1929), 140; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 462
Anon.
Determination of antipyrine in antineuralgic preparations
Prog. terap. Sez. farm., 18 (1929), 12; through *Chem. Abstr.*, 23 (1929), 5542
Anon.
Characters and tests for solution of nitroglycerin in the New Roumanian Pharmacopœia
Pharm. Monatsch., 10 (1929), 140; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 463
Christensen, E. V.
Analysis of barbituric acid derivatives
Arch. Pharm. Chemi, 86 (1929), 216; through *Quart. J. Pharm. Pharmacol.*, 2 (1929), 415
Dyson, G. Malcolm
Recent advances in the chemistry of the aldehydes
Perf. & Ess. Oil Rec., 20 (1929), 435
Fleury, Paul, and Marque, Jean
Comparison of the action of alkaline iodomercurate solutions on α- and β-glycerophosphates
J. pharm. chim., 10 (1929), 401
Glass, H. B., and Reid, E. E.
Direct introduction of sulphur into aromatic hydrocarbons
J. Am. Chem. Soc., 51 (1929), 3428
Rimattei, F.
Assay of dilute aqueous solutions of argyrol by photographic nephelemetry
J. pharm. chim., 10 (1929), 349
Sickman, Darrell V., and Fischelis, R. P.
Methoxyl content as a criterion of the composition of medicinal creosote
Jour. A. Ph. A., 18 (1929), 1145
Smith, Ralph B., *et al.*
p_H studies of neoarsphenamine
Jour. A. Ph. A., 18 (1929), 1142
Vorländer, D.
Dimethylhydroresorcinol as a reagent for aldehydes
Z. angew. Chem., 42 (1929), 46; through *Pharm. Zentralh.*, 70 (1929), 695

Vorländer and Guthke, F. W.
Action of alkalies on chloroform
Ber., 62 (1929), 549; through *J. pharm. chim.*, 10 (1929), 368

Wirth, E. H., and Dorjahn, J. A.
Phytochemical tests as pharmacopœial indentity tests
Am. J. Pharm., 101 (1929), 638

CLINICAL TESTS.

Stich, C.
Colorimetric detection of acetone in urine
Pharm. Zentralh., 70 (1929), 681

Tixier, L.
Estimation of urobilin in urine
Bull. sci. pharmacol., 36 (1929), 555

PHYSICIANS' PRESCRIPTIONS IN RELATION TO THE U. S. P. AND N. F. PREPARATIONS.*

BY P. J. KOLB.

Pharmacists should realize that in the United States Pharmacopœia and the National Formulary there are a number of formulas which physicians would gladly make use of, if they were consistently featured to them, and every pharmacist should endeavor to place the formulas and the finished preparations at the disposal of his own circle of physicians. Some of these formulas may be classified as vehicles, others as active remedies. As a rule, vehicles are calculated to make the administering of active drugs more palatable; among those, the following are quite satisfactory.

Compound Elixir of Almond
Elixir of Anise
Compound Elixir of Cardamom
Aqueous Elixir of Glycyrrhiza
Compound Elixir of Pepsin

There are a number of others, but these are good vehicles; Syrup of Wild Cherry, also, when prepared according to the official formula is always popular.

Among the active remedies the following deserve more consideration:

Elixir Terpin Hydrate
Compound Elixir of Terpin Hydrate and Creosote
Elixir of Three Bromides
Elixir of Five Bromides
Compound Cathartic Elixir
Compound Elixir of Euphorbia
Elixir of Iron, Quinine and Strychnine
Glycerinated Elixir of Gentian
Solution of Peptonized Iron and Manganese

The writer has had experience with various physicians featuring Compound Mixture of Chloral and Potassium Bromide; Compound Mixture of Glycyrrhiza; Compound Mixture of Rhubarb; Expectorant Mixture, known as Stokes Expectorant. This last formula was especially effective when recently prepared.

Compound Mixture of Glycyrrhiza is frequently prescribed with Sodium Iodide or Salicylate, and quite a number of physicians have replaced other formulas by these, with very satisfactory therapeutic effects. Physicians have told us that they had not before realized how satisfactory these preparations were.

Being your own detail man presents many advantages, and proves to the medical profession that the National Formulary is a reliable standard. In these days of strenuous merchandising the Prescription Department can show a far better profit if the pharmaceutical skill of the pharmacist is utilized in interesting

* Section on Practical Pharmacy and Dispensing, A. PH. A., Rapid City meeting, 1929.

the pharmacy's circle of doctors in the desirable formulas of the United States Pharmacopœia and National Formulary.

Alkaline Aromatic Solution has met with the approval of many physicians and it is surprising how satisfactory the home-made product really is, and it is easily prepared. I have seen some samples of this preparation in drug stores, when purchased in gallon quantities, of which the last portion was faded and almost unfit for dispensing. In the home-product the amount prepared can be adjusted to the demand created. It really is an elegant pharmaceutical and quite effective.

When the special effort of the detail man is over, the demand ceases, and a large number of these so-called physicians' proprietaries add to the dead stock of every pharmacy and have no inventory value. What is the remedy? Get behind the United States Pharmacopœia and National Formulary preparations, and prescription business will show a profitable increase.

ABSTRACT OF DISCUSSION.

P. Henry Utech commended the efforts of the kind presented by Mr. Kolb. He had obtained satisfactory results in his home city; physicians were not informed, as they should be, on United States Pharmacopœia and National Formulary preparations and were glad to have the information. Persistent and continued efforts will be followed by satisfactory results.

NOTES ON SOME OFFICIAL PREPARATIONS.*

BY P. HENRY UTECH.

Within a few months the machinery for the task of revising the U. S. P. X will be set in motion. So painstaking and thorough—and withal so efficient—has been the work of the former Committee of Revision, to their credit let it be said that the U. S. P. X stands to-day without a parallel in the literature of pharmacy. Comment and criticism of the book since its publication four years ago has been more favorable and constructive than has characterized any previous edition of the work.

That the publication of an official text of such high standard and unusual excellence—the major portion of which represents the voluntary service of a large group of research workers, laboratory experts, teachers, professional pharmacists and physicians—could be so successfully consummated, reflects a fine spirit of coöperation, of unselfish interest and loyalty on the part of the entire personnel of the organization.

To the end that the forthcoming volume may keep pace with its predecessors, and be equally free from errors both of omission and commission, every effort has been made by the chairman, through the medium of the pharmaceutical press, the meetings of the various state associations, the colleges of pharmacy, as well as many other possible sources of contact, to enlist the coöperation and support of all the related interests of pharmacy. The following suggestions and comments on certain official preparations which have come under my personal observation are herewith respectfully submitted for the consideration of the Revision Committee:

---

* Section on Practical Pharmacy and Dispensing, A. PH. A., Rapid City meeting, 1929.

Syrupus Aurantii: A formula for preparing Syrup of Orange similar to the present one has been official, with but slight modifications for the past five or six decades. In brief, they are simply processes for extracting the volatile oil from the rind of the fresh fruit with an alcoholic menstruum, and subsequently treating this liquor with an inert powder and sugar to render it water-soluble before admixture with the requisite amount of sugar or syrup. The addition of a small quantity of citric acid, to give the finished product a more characteristic flavor, was incorporated in Eighth Revision.

The present formula calls for the use of **Tincture Sweet Orange Peel,** the alcohol of which is neither necessary nor desirable. As at present devised the preparation appears to contain all the agents necessary to produce fermentation, minus the heat, and this latter is supplied unconsciously in the summer-time, as well as in overheated storerooms at any time. In fact I have had two successive lots of the syrup deteriorate within a few weeks after preparation.

With a view of overcoming this objection, the following formula for preparing the syrup extemporaneously was devised:

Oil Sweet Orange (recent)	6 cc.
Citric Acid	5 Gm.
Magnesium Carbonate	4 Gm.
Sugar	820 Gm.
Alcohol	
Water *aa qs* to make	1000 cc.

Mix the alcohol and water in the proportion of forty cubic centimeters of alcohol to twenty cubic centimeters of water. Triturate the oil intimately with the magnesium carbonate in a mortar and gradually add the diluted alcohol. Filter and add alcohol and water in the same proportions as before to obtain sixty cubic centimeters, returning the first portions until a perfectly clear solution is obtained. Dissolve the citric acid in this liquid and lastly add sufficient syrup to make one thousand cubic centimeters.

When there is little demand for the syrup, by simply keeping on hand the Spirit of Orange prepared as in the first step of the process, one can make it up extemporaneously by simply adding 2 cc. of the spirit to 30 cc. of syrup.

The formula herewith suggested possesses the advantage of economy in manipulation, is much superior in point of permanence, and if care be taken in selecting a strictly fresh high grade oil the finished product combines also the characteristic flavor and elegance of the U. S. P. syrup.

Syrupus Pruni Virginianæ: A footnote under the formula simply directs that it be preserved in tightly stoppered bottles in a cool place. Our experience has proven that when this syrup is kept in flint or clear glass bottles, both odor and taste undergo a perceptible change within a very short time. By storing in amber-colored bottles in a cool place the preparation retains the characteristic flavor for an indefinite period.

Spiritus Ammoniæ Aromaticus: The Purity Rubric should include within certain limitations an assay process for ammonia. Since its efficacy is dependent wholly on the amount of volatile ammonia present no methods are given whereby the official strength may be determined.

Tinctura Valerianæ Ammoniata: Even though every precaution be taken

in the percolation process to prevent it, the loss of the Aromatic Spirit cannot be avoided. This loss also increases perceptibly on standing. An assay process for ammonia should be included under the formula.

Liquor Magnesii Citratis: Objection to the promiscuous use of sodium bicarbonate in preference to the potassium salt has been raised by several physicians. In the latter case the potassium citrate in the finished preparation is of decided advantage in cases of kidney derangement where a diuretic action is desired, whereas in the case of the sodium salt this action is questionable. The question of economy should have little consideration where therapeutic efficiency is at stake.

It was voted to submit this paper to the Chairman of the U. S. P. Revision Committee.

ABSTRACT SECTION ON HISTORICAL PHARMACY, 1929.

"Medical and Pharmaceutical Knowledge of Balzac." by L. E. Warren, Drug Research Unit, Food Drug and Insecticide Administration, Washington, D. C.

Considered from every point of view it is generally conceded by critics that Balzac is the greatest novelist of all time. The writer has been an enthusiastic reader of Balzac for many years and has noted that there are many passages in his writings which show that Balzac had considerable knowledge of medicine and pharmacy as these were understood a hundred years ago. It seemed worth while to bring some of these to the attention of the Historical Section.

During his lifetime Balzac arranged most of his writings under the general title "Comedie Humaine." In the "Human Comedy," Balzac attempted to portray every human emotion in all the varying degrees exhibited by man. Love and hate, altruism and avarice, generosity and greed, magnanimity and anger, hope and despondency, grief, pleasure, pain, approbation and scorn, follow each other like the ever-changing colors in a rotating kaleidoscope. He attempted to paint every type of character, to depict every phase of human activity, to describe every profession, occupation and trade. Princes and paupers, nobles and peasants, politicians and authors, lawyers and priests, notaries and doctors, printers and painters, sages and idiots, lovers and mistresses, angels and cortesans are brought across his pages in an ever-bewildering procession. The Human Comedy is a picture of French Society of a century ago. It is far more than a picture—it is a mirror of human nature.

Unlike Dickens, who never lost an opportunity to ridicule the medical profession, Balzac had a general affection for physicians and some of his doctors are among the finest characters in French literature. References to medicines and their sources and to methods for treating the sick are constantly made throughout the length and breadth of the Human Comedy. Some of the stories are retold and many passages showing Balzac's knowledge of pharmacy and medicine are quoted, abstracted or reviewed.

ABSTRACTS OF SCIENTIFIC SECTION, 1929.

"Amino Alcohols. 3. The Potentiation of the Action of Epinephrine by Arylpropanolamines," by James C. Munch and W. H. Hartung.

Some arylpropanolamines homologus with ephedrine have a similar action with ephedrine in potentiating the pressor action of epinephrine in the anesthetized dog.

"Studies of Astringency: A Method of Measuring Astringency," by E. R. Theis.

If well-hydrated tissue is treated with an astringent liquid, a net increase of the system occurs, which can be accurately measured. The astringent action of various chemicals and commercial preparations has been demonstrated and is shown graphically.

"Oregon Drug Plants," by E. T. Stuhr.

Detailed list of drug plants found within the state.

"Gleditschia Triacanthos, Linné, a Preliminary Report on the Chemistry of the Fruit," by Loyd E. Harris.

Oleic, palmitic and stearic acids identified in fixed oil from seed. Glucoside found in seed and in seed pod.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

POPULARIZING THE PREPARATIONS OF THE UNITED STATES PHARMACOPŒIA.

(*Continued from p. 1165.*)

One group of the preparations of the United States Pharmacopœia (and National Formulary) are commonly used household remedies. The fundamental steps to be taken by a retail pharmacist to increase their sales were outlined in the preceding article in this series. Also included in this article was a list of some of these household remedies to which specific attention might be given by retail pharmacists.

Another group of preparations of the United States Pharmacopœia (and National Formulary) are preparations which are used in physicians' prescriptions, and, therefore, are ordinarily dispensed only on their orders.

The long-established method of popularizing proprietary preparations of this character has been to detail physicians (and other professional people) either in person or by mail. A modification of this method can be employed by retail pharmacists in their efforts to popularize the preparations of the U. S. P. and the N. F.

The modification calls for considerable finesse and tact if it is to be successful. For instance, I cannot imagine a pharmacist going from office to office with any success if his plan of action takes the following form.

"Doctor, are you familiar with fluidextract of Cascara Sagrada? I have some freshly made, in stock, in case you write any prescriptions calling for it."

If a physician is not highly incensed at having his time taken to have this unimportant information imparted to him, he at least has his opinion of the pharmacist's understanding of the professional side of his calling greatly depreciated.

A pharmacist's approach to physicians has to be far more subtle than that. For instance, a friend of mine in the retail drug business had had continuous complaints, particularly from the patients of one physician, about his prescription prices.

Many times the complaint had taken the following form.

"Why, Dr. Harrison told me this prescription would be only 75 cents and here you are charging me $1.10."

The druggist went to the physician, not in a belligerent or combative mood, even though this assumption of his prerogatives by the physician might have justified him in feeling that way.

Instead he approached the physician as follows:

"Doctor, I have had the pleasure of filling a number of your cough prescriptions lately, and I look forward to filling more of them. Naturally, I appreciate your

* Lecturer on Business, Columbia University and Philadelphia College of Pharmacy and Science.

interest and coöperation. The price I have been charging on this cough mixture you have been writing for most frequently has been $1.10, and the reason I have been charging $1.10 is on account of the advanced cost of some of the ingredients. Here's the way it works out, Doctor."

The druggist then took out a pad and pencil and showed the doctor that for the four-ounce mixture which he prescribed, the cost of the ingredients alone left him only a very small margin to cover his other expenses in compounding the prescription and his profit.

Suppose my friend had not stopped here. Suppose he had gone on as follows:

"Doctor, I have been wondering if there wouldn't be some way in which I could fill that prescription for 75 cents or 80 cents instead of the price I have to get now? Your patients and my customers would be better satisfied and you and I would be happier. Here is one idea that occurred to me. See what you think of it."

Then follows an explanation of how it appeared to the druggist as if the substitution of two medicaments from the United States Pharmacopœia in place of the compound mixture the doctor had been prescribing, would accomplish the same therapeutic effect.

Is such a procedure ethical and fair? Has the pharmacist any moral right to encourage substitution? The obvious answer is emphatically no. He must and should follow physicians' specifications, except in cases of apparent error, just as the structural engineer follows the designers' specifications, except for apparent errors.

On the other hand, a pharmacist has a perfect right to bring to physicians' attention, the merits of specific preparations and the advantages from their use. The group of such preparations with which pharmacists and physicians both have the greatest familiarity are those of the United States Pharmacopœia and National Formulary. The unethical thing to do is to propose their substitution in specified items. Such a procedure is just as unfortunate and, incidentally, just as unsatisfactory (if not more so) as persistently trying to persuade a person who asks for a proprietary to accept a substitute—"something just as good."

Detailing, which consists of calling attention to the merits of designated preparations of the U. S. P. (and the N. F.) can be accomplished in the store when physicians visit the store and by personal calls upon physicians. It also can be done over the telephone and by mail. Every retail pharmacist who has done successfully this type of detail work remembers well the constant care and caution which must be used to avoid even the appearance of trying to tell a physician how to carry on his practice. The position of the pharmacist in a situation of this kind is that of an advisor on the aspects of pharmacy, materia medica and pharmacognosy, which the alert physician is constantly seeking to be informed about, but with which the pharmacist, on account of his professional work, is likely to have more familiarity.

It is easy enough to say, bring the merits of certain preparations to physicians' attention. But what are these merits? If they aren't clear in the pharmacist's mind, how can he expect to put a clear impression in the minds of busy physicians, who have many other things to think about? Thorough study and analysis usually are necessary on the part of the pharmacist in order to get clearly in his own mind the merits of specific preparations. Then in talking to physicians about them, he

must be careful to choose those points which are most likely to be of interest and profit to them.

That is why concentration of effort upon the designated preparations of the U. S. P. and N. F. most likely to be prescribed immediately by the physicians of a locality is certain to produce the most definite and profitable results.

All efforts at detailing of this kind by pharmacists don't work out as smoothly as might be hoped. One of the most discouraging things that happens, after a special effort of the type just quoted, is to find that the physician accepts the recommendation readily enough, but all or almost all of his prescriptions go to a competitor's store.

Love's labor is not entirely lost, however. Certainly the physician, if he makes any recommendation at all, is likely to favor the pharmacist whom he holds in highest regard. This situation, however, is no different from that found in the sale of ordinary merchandise in a drug store.

I knew of a druggist who delivered and installed three different makes of radio in a prospective purchaser's home on trial and then learned later that the purchase had been made from another store which offered a 15 per cent discount. In the case of detailing physicians a wise caution, however, is to concentrate activities upon the physicians whose patients are most likely to bring their prescriptions to the store.

Remember, the measure of the effectiveness of the detail method of popularizing preparations with physicians is in the hands of every retail pharmacist. From his prescription file he can see readily enough that certain official preparations are in demand on account of prevailing sickness and suggest the possibilities for detailing. The retail pharmacist in detailing the physicians of his locality has the advantage of being in contact with them; this permanency gains him an acquaintance advantage with these physicians and the opportunity for creating a greater interest in preparations of the United States Pharmacopœia and the National Formulary.

(*To be continued*)

THE GERRARD MEDAL (ENGLAND).

A medal has been provided in memory of Alfred William Gerrard, whose outstanding work at Guy's Hospital, and investigations of alkaloidal drugs, particularly, *jaborandi* are recorded in chemical and pharmaceutical literature. The medal is to be awarded annually for "distinction in pharmacy."

THE AMERICAN INSTITUTE OF PHARMACY.

The Washington Star of November 30th carried a lengthy article by Chairman Charles Moore, of the Fine Arts Commission, on the beautifying of the section in which the Headquarters Building of the A. Ph. A. will be located. The report of the Commission from which the excerpt of the *Star* is taken contains the design and it is also reproduced in the paper mentioned. In other words the report expresses both satisfaction and approval of the plans for the American Institute of Pharmacy.

SHALL THE INDEPENDENT DRUGGIST SINK OR SWIM? IT DEPENDS UPON HIS INITIATIVE AND EFFORT!*

BY H. W. HEINE.[1]

The chain store is an established fact. Whether it is a desirable fact or an undesirable one, no good can be accomplished by calling it names. Like every other commercial venture it will flourish or decline in proportion as it serves or fails to serve public needs more efficiently and economically than competing agencies. So let us face it squarely, without bias, and try to see what it really is.

In 1928 there were 3893 chain organizations operating 101,536 stores. It is also estimated that there are about one and one-half million retail stores in this country. The proportion of chain store units to independent units is therefore very small. But chain stores distribute a larger proportion of merchandise than their numbers indicate.

Last year the public spent $40,000,000,000 as follows: 12% to chain stores; 4% to mail order houses; 1% to canvassers; 1/4 of 1% to consumers' coöperative associations; 16% to department stores; 63 3/4% to independent unit stores. In other words 80% of the retail business went to independent unit and department stores, against 12% to chain stores. This 12% represented the aggregate volume of chain stores of all kinds. In some fields they have a much larger share than this. For instance in the grocery business they get about 33 1/3%, in the drug business 20%.

The chain store can be called a menace to the independent retailer only in so far as it provides a type of competition which he is unable to meet, and which consequently threatens to drive him out of business. But according to Bradstreet's analysis, 35% of all business failures are due to incompetence, 35% to lack of capital which may be styled as a form of incompetence, 17% to specific conditions, 5% to inexperience, 4% to fraud and only 1.8% to competition. On the face of these figures it is obvious that competititon of any kind is much less a menace to the independent retailer than to his own inefficiency. The foregoing figures relate only to the present. What of the future?

The chain store system is a relatively new development. It is growing rapidly, much more rapidly than any other method of retail distribution. Its growth must necessarily be at the expense of the independent merchant. Will it keep displacing the independent merchant until it eliminates him altogether?

Storekeeping in recent years has undergone many changes. In the beginning, we may recall, trade was merely an exchange of products, then came the merchants and so on. Change is essential to progress and that progress involves the elimination of institutions which will not or cannot adapt themselves to it.

We are concerned with two practices which have come about during recent years. One of these is the idea of gathering under a single roof wide assortments of merchandise appealing to a great variety of tastes and pocketbooks, or expressed in more familiar terms, a store that sells anything from a needle to a white elephant,

---

* Section on Commercial Interests, A. PH. A., Rapid City meeting, 1929.

[1] Purdue University, School of Pharmacy.

or, if Dean Jordan of our school will permit me to use his term: "A store that sells everything from mouse traps to automobile tires."

The other practice of storekeeping is the idea of concentrating on a limited variety of standardized articles which are in wide and constant popular demand. The latter is the chain store idea. The first and most successful chains started with single stores operated by single merchants and were successful because of their policy and because of the brains behind them.

The question we have to face now is whether this system is in every respect superior to the system followed by the independent druggist. In other words, can the chain store render every service performed by the independent merchant and render it more efficiently and economically than he can? If it can, then it will eventually displace the independent merchant altogether. None of us anticipate such a change, and it will not happen, because there are limitations.

The success of the chain store is not due altogether to the fact that it is a chain store, nor its mere size and purchasing power, but I believe it owes much if not most of its success to the intelligence with which it is operated. The same principles that governed the success of the first store govern all stores. Success in operating so many stores does not lie in the great number itself but in the definite and practical knowledge of how to operate a single store in a single community. The success of the chain store, then, is primarily the outcome of superior merchandising brains applied to the business of retailing which have developed methods that are more or less applicable to every store, because they are founded on principles that are the same for chain stores and single stores.

You have heard it remarked that chain stores will not locate in towns where there is really live, independent competition. You will agree that if the independent merchant would wake up and adopt modern business methods before the chain stores came to his town instead of waiting until they arrived and got the jump on him, he would not have so much to worry about.

A good example of delayed awakening, which after all proved to be a change worth while, was recently demonstrated in one of our Indiana towns. When the druggists in this town heard of the advent of the chain, they immediately proceeded to clean up their stores, to advertise and rearrange their displays. In fact the change was so pronounced, it caused much comment over the state. Why did they not do this before?

It has also been demonstrated that many merchants who are surrounded by chain store competition are actually doing a better business than they were before the chain store came to their city. This leads to the conclusion that "the man behind the gun," is, after all, the man who does the shooting. The success of any business depends primarily on the ability and energy and character of the man by whom it is operated, and with these qualifications he can meet successfully any form of competition. The field is open, and in an open field the best man wins. People will go where they can get the best service and the best value.

The independent druggist, if he is to succeed under modern conditions, must have knowledge and apply it to his business. He has or ought to have the advantage of being closer to the heart of his community and is better able to judge its wants than the chain store. He should have the knowledge of how to control

his buying and his stock effectively, for this is necessary to maintain a proper turnover, and it is around this pivot which profitable merchandising revolves.

Ability to judge and meet demand is the first requirement to success in retailing. The next is effective promotion. A merchant may have the most desirable merchandise and the best values in town, but it will not profit him much if he does not have an attractive, clean, well-lighted store and if he does not draw attention to his merchandise and his values by proper display and advertising. At least it will not profit him much if he has a competitor down the street who uses these means to attract customers.

Efficient service is an essential part of successful sales promotion. Greatest success in retailing is achieved by serving the public in the most efficient manner; but it must be done as economically as possible. If we have two competing merchants who render identically the same service in every respect, the one who renders it at the lower cost is the one who will get the business. So it is necessary to keep down costs, and the best way to keep down costs is to buy right and sell right, for nothing runs up expense like slow turnover and frequent mark-downs. It is also necessary to control operating expense, and it is impossible to control this if careful record is not kept of every item entering into it. The Druggists' Research Bureau in conducting its surveys and case studies is gathering facts and figures as they really exist. The work of this bureau is in the interest of the independent retail druggist, concerns his problems and deserves his loyal support.

Efficient buying, efficient selling, efficient training and direction of personnel, efficient control of operating expense—these are the main reasons for chain store success, and all of them are within the power of the independent druggist. When it comes to the economies of quantity buying, the independent merchant seems to be at a disadvantage, but there are various ways in which this disadvantage may be overcome.

The greatest asset the independent retailer has is his individuality and he should feature this and do some of the things the chain stores cannot or will not do, and at the same time not neglect to practice sound business methods.

Some months ago a merchant in our town who was enjoying a very nice business decided to cut out credit and deliveries in order to meet chain store competition and proceeded to open branch stores in which this new principle was applied. There was a demand for credits and deliveries in this town and by deciding that he would no longer cater to this demand he lost a tremendous amount of business. His loss was so great that within a very few weeks he was forced to close all branch stores and go back to his former method of doing business and is now getting back on his feet again. In this case they were trying to beat the chain stores at their own game, and here it was a fatal mistake, because the people wanted credit and delivery service and were willing to pay for it.

The big opportunity for the independent merchant is to be as different as can be from his chain store competitor, feature service they do not give, to be distinctive, and last but not least to remember that he is operating a "drug store" and to feature the professional side of pharmacy, which after all, is his excuse for being in business. If he will do this and at the same time operate on the same sound business principles that govern the chain stores, he will have no reason to fear this or any other competition.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

The papers presented before the Teachers' Conferences of the American Association of Colleges of Pharmacy find their way into this Section of the JOURNAL A. PH. A. because we believe better circulation will be given them than would be the case if they were only printed in the Proceedings of the Association. The following paper on "Prescription Consciousness," by Dean P. H. Dirstine, of Washington State College, emphasizes the facts brought out by my address which appeared in the November issue of this Section. There is no doubt about the separation of professional and commercial pharmacy in our larger cities and, if we can teach our students "prescription consciousness" as suggested in this paper by Dean Dirstine, we will assist in this movement.—C. B. JORDAN, *Editor*.

PRESCRIPTION CONSCIOUSNESS.

BY P. H. DIRSTINE.

Sometime ago your chairman requested me to present a short paper on, "Creating a Prescription Consciousness." I made the mistake of letting him know two years ago that I had worked in a prescription store in a good prescription city, and he has made that the excuse of asking for this paper. I have assumed from his request, and the character of the members gathered here that he had in mind the creation of this consciousness in the minds of the students, but my discussion will cover a somewhat wider field than that.

There are some students who will, by virtue of previous training or experience, never develop a prescription consciousness. They have heard from the proprietor or clerk with whom they have been associated previous to entering college, that this so-called sanctum, commonly called the Prescription Room, is a losing game. It doesn't pay overhead, it contains a great deal of dead stock. The proprietor would rather not have any prescription business at all, he hates the prescription business any way, and wishes he could kick the whole department out into the street. He confidentially tells the boy that the only reason he has is because it makes the place appear like a drug store. In a great many places this condition is only too true. But why? That is the question.

The young man or woman trained for some time in such a drug store (so-called), is prejudiced against the prescription side of the business, before he or she enters college. The attitude of this individual is that of the true merchandiser, although this individual may or may not have the slightest idea of real merchandising. The individual entering college with this background would rather be selling a 50 cent tooth paste for 37 cents, or a package of razor blades for 36 cents, than spending five minutes filling a prescription on which a profit of from 50 to 80% may be made.

The vision of the late Professor Kraemer relative to the development of two types of drug stores is rapidly becoming true, especially in the cities of the West.

There is a development of two distinct types of pharmacists, not so much in college, although it begins in college, as in the practical field, one or two years after graduation from college. I am one of those who believes that the student in a college of pharmacy should in most cases be required to take a nearly set course of required pharmacy subjects, with a liberal number of elective courses. These

elective courses should cover a rather wide field to fill special requirements and desires. If this is to be the program for the average student, then the training required to give or create a prescription consciousness must be the same for all except, perhaps, additional electives related to prescription practice.

In creating this prescription consciousness and in placing the prescription end of the business in its proper perspective with the young student, I think the greater factor is an appeal to the human emotion, personal pride. Even to-day, with all of its commercial aspects, Pharmacy is looked up to by the layman as well as by those in other professions, as being a calling, demanding more than the average training and the exercise of average care and ability. The pharmacist is daily brought into contact with the physician and the better elements of society. It is easy to capitalize this contact with the professional classes, to the end that the young pharmacist may be taught to look upon his college work with an increased degree of professional pride. Practically the only side of professional pharmacy to-day is that carried on in the prescription room, whatever that may mean. In some stores, with practically no prescription business, it is nearly devoid of meaning.

Professional pharmacy means a changed social contact in ordinary life, to a large degree; a changed business contact in the every-day life of the individual; a professional pride entirely lacking in many pharmacies, and a somewhat limited business scope, as well as added responsibilities and unquestionable integrity.

Now the question is: How may these factors be brought before the young student in a school of pharmacy? Perhaps, what I suggest will not meet the universal approval of this body. It is well that it doesn't; disagreement leads to progress. First of all, a well-rounded practical course in prescription work should be given in every college of pharmacy. It is highly desirable that the person giving this work be in constant touch with practical pharmacy in an up-to-date way. He should be an individual who is himself sold on the ideal of professional pharmacy and who has had more than average training in that line; in other words an individual, who by training and practical experience inspires confidence in his students. The methods used in presenting incompatibilities, explosive mixtures, in fact, the unexpected, is a means of holding the students' interest. The use of thousands of prescriptions for prescription reading, as a regular part of the course, the criticizing of these prescriptions from the standpoint of contents, dose, incompatibility, method of filling, the price and other features add interest to the work. I have found the projection lantern very helpful in practice reading at sight. It helps to determine which students can really read the prescriptions, and those who have a tendency to deceive, by saying they can read and understand when they do not. One of the greatest factors we have at the Washington State College—to create interest in prescription work and to make for efficiency—is our system of 50 telephones, used in transmitting prescriptions to the students. The value of this cannot be overestimated. A general statement of prescription pricing, return on investment, limited capital, clean work, better salary and neatness demanded of students also appeals to the student, and helps to prove to him that the professional pharmacy is not the ordinary drug store. All of the factors I have indicated above combine to aid in placing the prescription end of the pharmacy training in its proper relation to the whole. In other words it creates a pre-graduation prescription consciousness.

I have touched in a very brief and general way upon some methods of creating a

prescription consciousness in a student. Now I wish to say a few words relative to creating a prescription consciousness in two equally important groups, namely, the physician and the general public:

I may be wrong in my assumption, but I believe that there are more doctors to-day, take the country over, that are prescribing their own medicine and filling their own prescriptions, than ever before. If I am correctly informed this is especially true in the Middle West and East. I was recently told by a progressive downtown pharmacist of Chicago, that he knew several doctors who had more prescription stock than he carried in his drug store, and that they were dispensing all of their own medicine. This is an unhealthy situation for pharmacy. Of course, I am not blind to the fact that this has to some extent always been true. It is especially dangerous at this stage, due to the fact that we have to-day a large percentage of doctors who do not think deeply and would hardly recognize the meaning of the letters, U. S. P. or N. F. if they saw them. With the large number of prepared products put out to-day, for physicians' use and sold by some firms directly to the doctor at a price as cheap as to the drug trade, it is only natural that the doctors who have a hard time to make ends meet when they first begin their practice should turn to this additional source of revenue to boost their net income. Once a doctor is engaged in this practice it is difficult to break the custom. I feel that we, as pharmacists, should discourage this direct sale to doctors by manufacturers, and also encourage in every way possible the proper attitude on the part of medical schools to the end that their graduates be encouraged in the art of writing prescriptions and are given a more intensive training in Materia Medica and Pharmacology. I would say that there is a lack of ability on the part of medical college training in this field.

During the past twelve years the writer has had the privilege of working during vacation periods in Spokane, Washington, and firmly believes that this city is the most "prescription conscious" of any city of its size in America. It has a population of 120,000 and has five exclusive prescription stores, doing approximately 75 per cent of the entire prescription business of the city. These stores are as fine as any in this country and it has been interesting to watch this prescription consciousness grow. The doctors are prescription-minded and with direct telephone connection to these stores, they never think of filling their own prescriptions, because they get real service of a high professional type, and the general public has developed a prescription consciousness, which places these professional ethical drug firms in a class by themselves. What has been accomplished in Spokane can and is being accomplished in other cities of the West. This can be done in the Middle West and East, but it will not take place over night, as it takes intelligent effort and hard work and plenty of it, but it looks to me to be the salvation for the individual who wishes to perpetuate pharmacy and its traditions, and maintain the prestige and professional atmosphere which the calling deserves. The building up of a business of this character and the developing of a prescription consciousness on the part of your physician and general public is a promotion in itself. To go into any of its many details, its lines of service, etc., would be out of place here. I hope this has at least given someone a determination to go home and aid in some way to promote professional pharmacy in his community. It is difficult to maintain a professional, exclusive prescription store in a city of less than 35,000, but our larger cities might well have more high-type stores of this kind.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The first meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for 1929–1930 was held on October 24, 1929, at the Emerson Hotel.

This well-attended meeting was called to order by President Frank L. Black, and the convention stay-at-homes were very much interested in hearing the reports from the members of the Branch who were so fortunate as to attend these meetings.

Dr. E. F. Kelly presented a résumé of the General Sessions of the AMERICAN PHARMACEUTICAL ASSOCIATION convention in Rapid City, S. Dak., especially mentioning the establishment of the Conference of Pharmaceutical Law Enforcement; and also the progress being made with regard to the Headquarters Building.

Dr. John C. Krantz, Jr. outlined the activities of the National Conference on Pharmaceutical Research, stating that plans were under way for the publication of the annual proceedings of the Conference. He also mentioned that the National Conference on Pharmaceutical Research was sponsoring the publication of a book to popularize the pharmaceutical profession—The Story of Pharmacy—"Fighting Disease with Drugs."

Dr. A. G. DuMez prefaced his report with a short history of the formation of the American Association of Colleges of Pharmacy. He then outlined some of the accomplishments of the Association during 1928–29, particularly mentioning the preliminary arrangements which have been made for a survey of pharmacy, which is being undertaken by the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION.

Dr. R. L. Swain reported the work accomplished by the National Association of Boards of Pharmacy during 1928–1929, and made particular reference to the good influences emanating from the various District Meetings held during the past two years. He also commented on the results that are to be expected from the establishment of the Conference on Pharmaceutical Law Enforcement.

Editor E. G. Eberle exhibited the first copy of the "Pharmaceutical" Recipe Book, which was presented to the AMERICAN PHARMACEUTICAL ASSOCIATION during the Rapid City convention by the Baltimore Branch as a memorial to the late Henry P. Hynson, in whose mind the Recipe Book had its origin. This copy of the Recipe Book has been handsomely bound and engrossed with an appropriate inscription, and will eventually be placed in the Headquarters Building in Washington.

When Mr. Howell W. Allen was requested to give a report of the N. A. R. D. Convention in Minneapolis, he presented his daughter, Miss Marjorie E. Allen, who gave a comprehensive and entertaining description of the happenings and sidelights of this Convention.

Mr. Salvatore Molinari, pianist, and Mr. J. J. Wilson, violinist, added to the enjoyment of the evening by rendering several selections.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 185th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, November 19th, at the University of Illinois, School of Pharmacy.

Prof. A. H. Clark introduced the speaker of the evening, Dr. A. J. Cramp, Director of the Department of Investigation of the American Medical Association, who spoke on "Patent Medicine and the Public."

Patent medicines and proprietaries are analyzed for their chemical composition, claims made in advertising are investigated for their truthfulness and are exposed if found unworthy of the claims of the manufacturer.

Patent medicines have a secret formula and the name trade marked whereas a patented medicine must be new and useful.

Dr. Cramp told in a most interesting manner about fraudulent advertising of patent medicines in newspapers. Very few claims for the medicine are made on the package due to the Pure Food and Drugs Act, which prohibits false statements and requires that certain dangerous ingredients be printed on the package.

Testimonials of many patients have been found to be absolutely unreliable.

Some of the absurd and preposterous statements in patent medicine literature were presented in a delightfully entertaining and instructive manner. The talk was well illustrated by the use of lantern slides, showing the composition of the patent medicines discussed.

A general discussion followed the lecture, during which many inquiries about other patent medicines were answered.

The meeting adjourned with a rising vote of thanks for Dr. Cramp's most entertaining and instructive lecture.

S. W. MORRISON, *Secretary.*

DETROIT.

The November meeting of the Detroit branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Y. M. C. A. Building, November 21st. About sixty members and friends attended; a dinner preceded the meeting. Students and faculty members of the University of Michigan College of Pharmacy helped to swell the attendance; among them were Dean Kraus and Prof. Glover.

In the absence of President Koelzer, First Vice-President John Webster, Jr., of the U. of M., presided. The minutes of the October meeting were read by the Secretary and approved.

Chairman Lakey, of the program committee, announced that Dr. Leonard A. Seltzer had prepared an interesting talk for the December meeting. Mrs. Joseph Gowman will lecture on the "Psychology of Drinking" at the January meeting. The February, March and April meetings will be given over to the student programs. The May meeting is to be held in Ann Arbor and the program will be prepared by the U. of M. These programs assure another successful year for the Detroit Branch.

Chairman Burniac, of the membership committee, handed in five applications, bringing his total up to 22.

Mr. Webster then introduced the speaker of the evening, Mr. C. N. Anderson, chief of the Animal Industry Department of Parke, Davis & Co. Mr. Anderson startled his listeners with figures impressing them with the immensity of the livestock industry. He said, the combined automobile, steel and building investments did not equal those of the livestock industry in importance.

Until the discovery by Maurice Hall of carbon tetrachloride as an anthelmintic, losses of livestock by parasites were unbelievably large. The study of carbon tetrachlor ethylene was begun in 1923, and, in 1926, dogs and foxes were treated. The fox industry represents very large industrial and commercial investments. The American Farm Bureau Federation devises means and plans to educate the farmer; $56,000,000 are spent annually for this purpose; 1,250,000 farmers subscribe to the federation.

The losses in livestock annually are $140,000,000 or more; infestation of parasites is the cause of three-quarters of this loss; a very large part of this loss can be eliminated by proper treatment. Poultry values are placed at $1,040,000,000; the immensity is seen when compared to the whole agricultural industry, which does not reach three billion dollars.

Mr. Anderson's talk was followed by the showing of the film, "Settled Out of Court," prepared by the American Farm Bureau Federation. This film was very interesting and educational.

After a vote of thanks to the speaker, Mr. Seltzer offered a resolution to send flowers to Harry B. Mason, who is seriously ill at the

Ford Hospital. Mr. Mason is an outstanding figure in pharmacy. He was the first chairman of the program committee of the Detroit Branch and framed its by-laws. The resolution received the unanimous support of the assembly.

BERNARD A. BIALK, *Secretary.*

PITTSBURGH.

The Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION met at the School of Pharmacy, Tuesday evening, November 19, 1929.

President John G. Rees called the meeting to order at 8:00 P.M.

Dr. Louis Emanuel, the delegate from the Pittsburgh Branch to the House of Delegates of the AMERICAN PHARMECEUTICAL ASSOCIATION, made his report.

The program of the evening was in charge of Dr. L. K. Darbaker, who gave his impressions of the meeting of the Association at Rapid City. He also presented several reels of pictures of the western country, considering phases that were of interest to the assembly.

His review of the geology, the vegetation and the wild animal life of the western National Parks was very instructive.

Comments were made by the members.

FRANK S. MCGINNIS, *Secretary.*

UNIVERSITY OF WASHINGTON.

The first meeting of the year of University Branch, A. PH. A., was held October 31st in Bagley Hall. President Earl Guth called the meeting to order and introduced F. J. Anderson, of McKesson, Stewart and Holmes, as the speaker of the evening. Mr. Anderson, who is in charge of the fixture department of this company, gave an interesting talk on drug store fixtures. The following points were considered in order: location, illumination, entrance, windows; inside arrangement as to fountain, prescription case, wrapping counter, cash register, inside displays, floor covering and aisle space. His talk was followed by questions from the members.

NOVEMBER.

The second meeting was held November 21st in Bagley Hall, Earl Guth presiding, C. S. Whittlesey, assistant manager of McKesson, Stewart and Holmes, wholesale druggists, presented the second talk of this series. Mr. Whittlesey's talk was on opening a new store. The following points were considered: financing the venture, ownership, location and size of store, rentals, ratio of investment of stock and fixtures, relation of locality to stock, name of store, cash purchasing *versus* credit with jobbers, bookkeeping and accounting, source of supplies and stock.

Many interesting questions were asked at the conclusion of the talk.

H. A. LANGENHAN, *Secretary.*

ANNUAL MEETING OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS.

The 45th Annual Meeting of the Association of Official Agricultural Chemists was held in Washington, October 28th–30th. In addition to the methods of analysis for drugs described in the U. S. Pharmacopœia and the National Formulary, the Official and Tentative Methods of Analysis of this Association are recognized by the courts. As an example of the care taken to prevent the introduction of error it should be stated that before a method is adopted as "official" by the Association it must have been subjected to collaborative study under the direction of an Associate Referee for at least two years with favorable findings. Eighty-six reports were presented.

H. B. McDonnell, in his address as President of the Association, reported the results of his experiments with ozone in the treatment of rabbits infected with tuberculosis. The infected rabbits died sooner than the controls, indicating that ozone is a harmful rather than a curative agent. The animals were caused to breathe ozone in various concentrations.

The meeting of the section on drugs was attended by about forty chemists. Eighteen reports were submitted to this section, covering a variety of topics. Examples are: "The Assay of Mercuric Iodide Tablets," "The Assay of Oil of Chenopodium," "The Assay of Ephedra," "The Determination of Ether in Presence of Alcohol," "The Microchemical Detection of Caffein and Brucine" and "A Review of Colorimetric Methods for the Determination of Vitamins." A topic of particular interest to pharmacists was the report on chenopodium oil, by L. B. Broughton and G. S. Weiland, of the University of Maryland. The U. S. Pharmacopœia assays the oil for its active constituent, ascaridol, by the solubility of that substance in 60% acetic acid. The inert hydrocarbons of the oil remain insoluble in this solvent. Some years ago Paget showed

that if oil of chenopodium were adulterated with certain pinenes the fact could not be detected by the U. S. P. assay. He devised a method by which the ascaridol is oxidized by a standardized solution of titanium chloride. His findings have now been confirmed by Broughton and Weiland, who find that Paget's method is reliable. The discussion disclosed that oil of chenopodium is particularly toxic to male hookworms and also to roundworms. Carbon tetrachloride is especially effective against female hookworms, but has no effect on roundworms. On this account the two drugs are frequently prescribed together. The Paget method will be further studied upon mixtures with a view of making it official.

Officers elected for the coming year are: *Honorary President*, H. W. Wiley, Washington, D. C.; *President*, E. M. Bailey, New Haven, Conn.; *Vice-President*, H. D. Haskins, Amherst, Mass.; *Secretary-Treasurer*, W. W. Skinner, Washington, D. C.

The Association endorsed the nomination of Dr. Lyman Spalding, "Father of the U. S. Pharmacopœia," for the Hall of Fame, New York University.

INTERNATIONAL PHARMACEUTICAL FEDERATION.

The International Pharmaceutical Federation will hold its next meeting at Stockholm, July 16–18, 1930. The Board of the Federation held sessions in Berlin, October 30–31, to discuss matters that will be brought before the meeting in Stockholm for action. H. N. Linstead (Great Britain) has been studying the subject of dispensing of medicine on ships. (Information relative to the United States has been supplied from the JOURNAL office.) Mr. Linstead has been invited to prepare a report for presentation in Stockholm.

Among those present at the meeting in Berlin were Dr. Salzmann, president of the Deutsche Apothekerverein; Dr. W. Wartenberg and Dr. Hans Meyer, of the *Apotheker Zeitung;* Prof. Dr. H. Thoms, of the University of Berlin; the foregoing will be remembered as visitors in this country several years ago. Others were—Prof. Dr. L. Van Itallie, Dr. J. J. Hofman, both of whom and the last named of the first group are honorary members of the A. PH. A.; M. Barthet, Paris; Dr. A. Schamelhout, Brussells; E. Poignant and Dr. A. Rising, Stockholm; Prof. Baggesgaard-Rasmussen, Copenhagen.

The proceedings of the first day were opened by Prof. Van Itallie, who made a brief report to the Board. In discussing the work of the Federation in Paris, last year, it was suggested that a committee be organized for collecting formulas for the preparation of an international formulary. The report of the Committee on International Nomenclature was discussed, but no definite action was taken. The Deutsche Apothekerverein entertained the visitors at supper on the day preceding the Board meeting.

The question of the control of proprietary medicines by national laboratories and the international coöperation of such laboratories was discussed as the outcome of a report by Dr. Rising, in which it was suggested that the control of proprietary articles must be carried out coöperatively by pharmaceutical associations in the various countries. A committee was appointed to examine the Swedish methods of analysis, to compare them with other methods, and to make proposals at the Stockholm meeting. Tentative arrangements for this meeting include dinners and an outing.

WELLCOME HISTORICAL MUSEUM.

An interesting reception was held at the Wellcome Historical Medical Museum, London, on November 11th, to meet the president, committee and members of the Egypt Exploration Society. In the absence of Dr. Henry S. Wellcome,[1] Dr. C. M. Wenyon, director-in-chief of the Wellcome Bureau of Scientific Research, received the guests. Warren R. Dawson read a paper on "Egyptian Medicine." He brought out that these early investigations, though primitive and empirical, led up to scientific thought and laid the foundation upon which later investigators were to build. The foregoing reference to the valuable contributions to medical and pharmaceutical studies through this museum suggests opportunities for the museum of the American Institute of Pharmacy.

ANAESTHETIC ETHER.

The preservation of anaesthetic ether over powdered iron to prevent formation of peroxides does not answer, as such ether contains acetaldehyde. Iron powder certainly prevents peroxide formation, but not the oxidation to acetaldehyde.—N. Schoorl (*Pharm. Tijdschr*).

[1] Dr. Wellcome has been a member of the A. PH. A., since 1875, and is very much interested in the American Institute of Pharmacy.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1929–1930.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 3.

November 16, 1929.

To the Members of the Council:

25. Minutes of the First Meeting of the Council. Motion No. 1 (See Council Letter No. 2, page 1210) is carried and the minutes of the first meeting are approved.

26. Investment of Funds. Motion No. 2 (See Council Letter No. 2, page 1210) is carried, and the following bonds have been purchased for the funds mentioned:

Endowment Fund.

$1000 State of Tennessee 4½%, due 1944, on a 4.50 basis.

Centennial Fund.

$1000 State of Tennessee 4½%, due 1944, on a 4.50 basis.

Research Fund.

$2000 State of North Carolina 4½%, due 1949, on a 4.40 basis.

$5000 State of North Carolina 4½%, due 1954, on a 4.35 basis.

$3000 State of Illinois 4%, due 1944, on a 4.40 basis.

$5000 City of Dallas, Texas 4½%, due 1947, on a 4.55 basis.

$3000 City of Newark, New Jersey 4½%, due 1932, on a 4.35 basis.

Life Membership Fund.

$3000 City of Chattanooga, Tenn. 4½%, due 1959, on a 4.70 basis.

Procter Fund.

$1000 State of Illinois 4%, due 1942, on a 4.30 basis.

Remington Fund.

$1000 City of Newark, New Jersey 4½%, due 1944, on a 4.35 basis.

27. Election of Members. Motion No. 3 and Motion No. 4 (See Council Letter No. 2, page 1211) have been carried and applicants for membership numbered 1 to 35 inclusive, and applicant for membership numbered H-1 are declared elected.

28. Use of Text of N. F. V. The following communication has been received from Chairman DuMez of the Committee on Publications:

"I went over Dean Spease's manuscript on the proposed textbook in Pharmaceutical Mathematics and advised him that it was customary for us to charge a nominal fee of $5.00 for the use of the National Formulary text in the manner intended by him.

"Since I have gone over the manuscript and find that it does not involve any extensive use of the National Formulary, I move that he be granted permission to use the text as requested and that the fee of $5.00 be charged for this purpose."

(*Motion No. 5*) *It is moved by DuMez that Dean Edward Spease be granted permission to use the text of the N. F. V for partial reproduction in his textbook on Pharmaceutical Mathematics and at the usual charge of $5.00.*

29. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 36, Iku Ariizumi, 108—28th Ave., Seattle, Wash.; No. 37, Geo. B. Bradburn, 4210 Brooklyn St., Seattle, Wash.; No. 38, Lewis C. Britt, College of Pharmacy, University of Washington, Seattle, Wash.; No. 39, Russell A. Cain, 4003—15th St., N. E., Seattle, Wash.; No. 40, John L. Dandreau, 156–10 Channel St., Howard Beach, N. Y.; No. 41, Rodger S. Dille, 5530 South Puget Sound Ave., Tacoma, Wash.; No. 42, Frank Norbert Doyle, 4016 Meridian Ave., Seattle, Wash.; No. 43, James T. Dumas, Foley, Ala.; No. 44, Harry Edward Thompson, 1818 E. 45th St., Seattle, Wash.; No. 45, Claire Evans, 3603 W. Holly St., Seattle, Wash.; No. 46, Louis Fischer, 4226—11 Ave., N. E., Seattle, Wash.; No. 47, Mrs. Jennie Webb Fletcher, 90th and 28th Ave., N. W., Seattle, Wash.; No. 48, Carl W. Frederick, 1702 Nob-Hill Ave., Seattle, Wash.; No. 49, Lewis G. Freeman, University of Buffalo, School of Pharmacy, Buffalo, N. Y.; No. 50, Ewin Gillis, 4303 12th Ave., N. E., Seattle, Wash.; No. 51, John Martin Goach, 7617 Latona Ave., Seattle, Wash.; No. 52, La Monte Grisham, General Delivery, Sedro Wolloy, Wash.; No. 53, Carl H. Johnson, 4708—18th N. E., Seattle, Wash.; No. 54, Elsie Anna Johnson, 2223 11th Ave. No.,

Seattle, Wash.; No. 55, Paul Simon Jorgenens, 315—12th Ave., No., Seattle, Wash.; No. 56, Ray Francis Kerns, 6756—17th Ave., N. W., Seattle, Wash.; No. 57, Edward Allen Kiefer, 1823 Nob-Hill Ave., Seattle, Wash.; No. 58, Estella Koozin, 2519 14th Ave., So., Seattle, Wash.; No. 59, Hilding Carl Lindstrom, 4221 Aurora Ave., Seattle, Wash.; No. 60, Ada Clara Marckx, 5921 24 S., Seattle, Wash.; No. 61, Cristobal Martiner-Rebelgo, Independencia No. 17, Gibara, Cuba; No. 62, Edward Harlan Michel, 3302 Colby Ave., Everett, Wash.; No. 63, Paul Crandall Olson, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.; No. 64, Marion P. Ostlitt, 5406 Latona Ave., Seattle, Wash.; No. 65, Liberino Patricolli, 1133 23rd Ave., So., Seattle, Wash.; No. 66, Lyle J. Paul, 4532—18th N. E., Seattle, Wash.; No. 67, Harry Quint, 418 21st Ave., Seattle, Wash.; No. 68, Ethel S. Radford, 2045 Parkside Drive, Seattle, Wash.; No. 69, Lono W. Tobey, 4708 18th Ave., N. E., Seattle, Wash.; No. 70, George T. Tokuda, 1413 East Spruce St., Seattle, Wash.; No. 71, Salvatore Trischitti, 466 2nd Ave., New York, N. Y.; No. 72, Emanuel M. Weber, 5256 11th N. E., Seattle, Wash.; No. 73, Mrs. Clara Karron Young, 4725—15th N. E., Apt. 28, Seattle, Wash.

(*Motion No. 6*) *Vote on applications for active membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

THE DICTIONARY OF AMERICAN BIOGRAPHY.

"The following notes (*Science* for August 2, 1929, page 121) on the second volume of the Dictionary of American Biography are written, not with any desire to find fault, but rather where a work is so good, to ask why it might not be a little better.

"Human touches introduced into some of the sketches are commendable. However, the work will serve primarily a public chiefly interested in fact or judicial appraisal.

"To satisfy such readers, some degree of uniformity in treatment is desirable, if for no other reason than this, that the time of the investigator is saved. The "Who's Who" method of presenting essential facts might well be considered by the editors.

"It is not suggested that all such facts are of equal relevance, but surely the interest in genetics justifies the inclusion of all significant facts of inheritance. To illustrate, the reader of the sketch of Charles E. Bessey might very properly have been informed that his son, E. A. Bessey, is also a distinguished botanist.

"My attention was particularly caught, in reading the sketch of B. S. Barton, by the failure to note the reprint of his Collection toward a Materia Medica, in Lloyd's *Bulletin*, No. 1, in 1900. The article shows other omissions of noteworthy facts. For example, no mention is made of the honor bestowed upon Barton by Nuttall in naming a genus of plants *Bartonia*. This name has been dropped, as Muhlenberg had given the name *Bartonia* to another genus and Nuttall's *Bartonias* are now *Menzelias*. Barton's aid to both Pursh and Nuttall is a significant fact in the history of American botany. Barton himself took credit for the fact; see Lloyd's *Bulletin*, No. 1, page 3. A reference to Barton's connection with William Bartram, referred to in the article on Bartram, should certainly have been included.

"A print of one portrait of Barton is mentioned, but the much more accessible reprint in *Popular Science Monthly* for 1896 (vol. 48) is not mentioned.

"The bibliography is, of necessity, brief, but it might very properly have included a reference to the article in the *Popular Science Monthly* (vol. 48:834–40); possibly also to the reprint of the sketch of W. P. C. Barton, in his *Revised Elements of Botany*, in 1836.

"Some other articles in the volume are subject to similar criticism. Let this instance of Barton stand as an example. If it be urged that space is limited, it might be answered that at least the facts here mentioned are more significant than some of those included. Nothing should be omitted from the Barton sketch as it is printed, but a little condensation would have permitted the inclusion of everything here suggested.

"The omission of (q. v.) after the name of T. P. Barton is, of course, only an oversight. Last of all, permit a query of fact: In the article on Jacob Bigelow, should it not be B. S. Barton, not W. P. C. Barton, under whom Bigelow studied? WILLIAM H. POWERS

Library, South Dakota State College."

"Pharmacy is a conservative profession, and many believe that it has been lacking in initiative and policy in not following and embracing the modern tendencies of therapeutics."—W. E. Dixon, M.D., F.R.S., at presentation of the Gerrard Medal at Birmingham, England.

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase Street, Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, H. C. CHRISTENSEN, C. E. CASPARI, J. H. BEAL, W. BRUCE PHILIPS, T. J. BRADLEY. *Ex-Officio Members:* D. F. JONES, *President;* A. L. I. WINNE, W. B. GOODYEAR, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* R. L., SWAIN, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; ———, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; H. A. LANGENHAN, GLENN L. JENKINS, H. C. NEWTON, DENNY BRANN, GEORGE D. BEAL; A. G. DUMEZ, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; JOHN A. J. FUNK, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

NEW AND NONOFFICIAL REMEDIES.

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the Rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

DIGIFOLINE-CIBA.—A digitalis preparation containing the active glucosides of digitalis, free from extractive matter. It is standardized to have the strength of digitalis leaves as standardized by the frog method of Focke ("Nachweis und Bestimmung von Giften auf biologischem Wege," by H. Fuhner, 1911).

Actions and Uses.—The same as those of digitalis.

Dosage.—Digifoline-Ciba may be administered orally, rectally, or by subcutaneous intramuscular or intravenous injection: three digifoline-Ciba tablets by mouth or 2 cc. of digifoline-Ciba solution hypodermically, daily, during three days, followed by intervals of ten days, if it is necessary to repeat the treatment; in acute conditions, four digifoline-Ciba tablets orally, or 3 cc. of digifoline-Ciba solution hypodermically or 1 to 2 cc. of digifoline-Ciba solution intravenously. The maintenance dose is one digifoline tablet daily for five days in every fourteen. The massive dose method with digifoline-Ciba is as follows: The average dose required having been determined on the basis of 1 minim of digifoline-Ciba solution for each pound of body weight, one fourth of this is given at once and the remainder is divided in from three to six doses and administered at intervals of four to six hours until the desired effect is obtained or some effect of digitalization becomes manifest.

Manufactured by the Society of Chemical Industry in Basle, Basle, Switzerland (Ciba Company, Inc., New York, distributor). No U. S. patent. U. S. trademark 99,808.

Ampuls Digifoline-Ciba Solution, 1 cc.: Each ampul contains 1.1 cc. of a digifoline-Ciba solution, each cubic centimeter containing digifoline-Ciba equivalent to 0.1 Gm. (1½ grains) of digitalis leaves standardized by the Focke method.

Ampuls Digifoline-Ciba Solution, 5 cc.: Each ampul contains 5 cc. of a digifoline-Ciba solution, each cubic centimeter containing digifoline-Ciba equivalent to 0.1 Gm. (1½ grains) of digitalis leaves standardized by the Focke method.

Digifoline-Ciba Liquid: Each cubic centimeter contains digifoline-Ciba equivalent to 0.1 Gm. (1½ grains) of digitalis leaves standardized by the Focke method. It contains 12 per cent of alcohol.

Tablets Digifoline-Ciba: Each tablet contains digifoline-Ciba equivalent to 0.1 Gm. (1½ grains) of digitalis leaves standardized by the Focke method.

Dried and finely ground digitalis leaves are extracted with distilled water. The neutralized filtrate is then treated with alcohol, precipitated with a solution of lead acetate and filtered. The filtrate, after the removal of the lead and neutralization, is filtered and concentrated to a certain volume in a high vacuum at a temperature not exceeding 30° C. The active principle which separates through the foregoing concentration is collected and dried under a high vacuum at a temperature of 40° C. It is then dissolved in methyl alcohol, the filtrate treated with chloroform and the chloroform, separated from the aqueous solution, distilled off and the residue dissolved methyl alcohol. The aqueous solution which has been separated from the chloroform solution is treated with a mixture of ether two parts and benzene one part; the ether-benzene extract is concentrated under high vacuum at low temperature and the remaining residue dissolved in methyl alcohol. The several methyl alcohol solutions are mixed, decolorized with charcoal and concentrated under a high vacuum to a dry residue, which constitutes digifoline-Ciba.

Digifoline-Ciba is almost colorless and odorless, with a slightly bitter taste. It is an amorphous brownish powder, soluble in water, methyl alcohol and ethyl alcohol; insoluble in ether and petroleum ether.

Prepare two solutions: (A) Dissolve ferric sulphate, 5 Gm., in water, 100 cc., filter and add 5 cc. of the filtrate to 500 cc. of pure glacial acetic acid; (B) add 5 cc. ferric sulphate solution (ferric sulphate, 5 Gm. in water, 100 cc.) to 500 cc. pure sulphuric acid. Dissolve a trace of digifoline-Ciba in 5 cc. of solution A and layer this solution carefully on 5 cc. of solution B: at the point of contact, a dark band appears; the lower layer assumes a red color and the upper layer a bluish green color; on standing, the bluish green layer turns to indigo-blue.

CONCENTRATED POLLEN EXTRACTS-

SWAN-MYERS (See New and Nonofficial Remedies, 1929, p. 26).

The following product has been accepted:

Canada Blue Grass Concentrated Pollen Extract-Swan-Myers.—Prepared by the method given for concentrated pollen extracts-Swan-Meyers (New and Nonofficial Remedies, 1929, p. 26).

SULPHARSPHENAMINE-SEARLE (See THE JOURNAL, April 20, 1929, p. 1349).

The following dosage forms have been accepted:

Sulpharsphenamine-Searle, 0.1 Gm. Ampuls.
Sulpharsphenamine-Searle, 0.2 Gm. Ampuls.
Sulpharsphenamine-Searle, 0.3 Gm. Ampuls.

From *Jour. A. M. A.* for June 15, 1929.

LUMINAL-SODIUM (See New and Nonofficial Remedies, 1929, p. 81).

The following dosage form has been accepted:

Ampuls Luminal-Sodium (Powder), 2 grains.

From *Jour. A. M. A.* for June 22, 1929.

ALKALOID OF ARTABOTRYS SUAVEOLENS.

The bark of the root and stem of Artabotrys Suaveolens, Blume., a native of the Philippines, contains an alkaloid, artabotrine $C_{36}H_{38}NO_6$; m. p. 187° C.; freely soluble in chloroform; sparingly soluble in ether and in other organic solvents; practically insoluble in water. It crystallizes from ether in cubical crystals, and from chloroform in radiating tufts. It is slightly bitter; not precipitated by the usual alkaloidal reagents. It dissolves to give a colorless solution in sulphuric acid, which becomes red, then yellow, on adding nitric acid. In sulphuric acid, containing sugar, it gives a pink color changing to reddish violet; with Froehde's reagent a dirty green to blue color results. In strong nitric acid it is dissolved to a red, then greenish yellow, and finally yellow solution. Solutions in strong hydrochloric acid, and in acidified sodium nitrite solution remain colorless. A few milligrams of the hydrobromide were fatally toxic to a guinea-pig by hypodermic injection; the symptoms were dyspnœa, stretching of the limbs, dilation of the pupils and convulsions. These symptoms are very similar to those produced by anonaceine, as indicated by De Rochebrune. The hydrochloride and hydrobromide form definite crystals, which are illustrated.—J. M. Maranon in *Philippine J. Sci.*, 38 (1929), 259; through *Quarterly Jour. Pharmacy and Pharmacology.*

IODINE RESEARCH PROGRAM.

Since January 1, 1928, Mellon Institute of Industrial Research, Pittsburgh, Pa., has had in operation a Multiple Industrial Fellowship founded for the purpose of investigating the properties and uses of iodine. This Fellowship, which is sustained by the Iodine Educational Bureau of New York City, is headed by Dr. George M. Karns, formerly of the University of Illinois.

Recently, through an additional appropriation from the Fellowship donor, Mellon Institute, acting for the Iodine Fellowship, has made arrangements for the study of certain iodine problems in other institutions that have special facilities for such types of work. On October 7, 1929, a scholarship was founded at the Philadelphia College of Pharmacy and Science by a research grant from the Institute. This scholarship—which, for the college year 1929–30, will be held by Mr. L. F. Tice—will have for its aim a broad investigation of vehicles and solvents for iodine, especially for external use in medicine. A large number of new organic chemicals will be studied as solvents with the object of evolving, if possible, a more satisfactory preparation than the alcoholic tincture now in use. The research, for which a definite program has been laid down, will be supervised by Prof. Charles H. LaWall with the advisory collaboration of other faculty members of the Philadelphia College of Pharmacy and Science and with the direct coöperation of Dr. Karns. The investigational findings of the scholarship will be reported in the literature.

The nutritional place and value of iodine in the feeding of live stock is being studied at Pennsylvania State College. The work is being directed by Prof. E. B. Forbes, under special grants for extramural research. The Mellon Institute is also giving consideration to the founding of a research scholarship in a medical school for the purpose of aiding in the solution of incompletely answered questions respecting the utility of iodine in internal medicine. A number of pharmacologists are aiding the Institute in determining a program for such pharmacodynamic inquiry.

UNIVERSITY OF VIRGINIA OPENS LABORATORY TO INVESTIGATE ALKALOIDS.

The University of Virginia announces the opening of a laboratory where a series of investigations in the chemistry of alkaloids and

related substances will be carried on under the auspices of the Division of Medical Sciences of the National Research Council. Lyndon F. Small, research associate at the university, has been appointed director of the new laboratory. The present personnel includes Erich Mosettig, University of Vienna, Alfred Burger, University of Vienna, Frank L. Cohen, Northwestern University, Jakob van de Kamp, University of Utrecht and Louis Eilers, University of Illinois.

NOBEL PRIZES IN MEDICINE.

Dr. Christian Eijkman, of the University of Utrecht, and Sir Frederick Gowland Hopkins, professor of biochemistry at the University of Cambridge, England, have been awarded the 1929 Nobel prize in medicine. In 1889 Professor Eijkman succeeded in producing polyneuritis in fowl by feeding them a diet consisting exclusively of completely polished rice. In 1906, Professor Hopkins demonstrated that an accessory food substance besides proteins, fats and carbohydrates was necessary for growth, reproduction and maintenance of life in animals. Since then both scientists have done considerable research in their respective fields. Professor Hopkins has been called discoverer of the vitamins.

CHEMISTRY AWARDS.

The Swedish Academy has divided the Nobel chemistry prize for 1929 between Dr. Arthur Harden, head of the biochemical department of the Lister Institute and professor of biochemistry in London University, and Prof. Hans Euler, of Stockholm.

The Nobel prize for physics for 1929 was awarded to the Duc de Broglie and the 1928 prize to Professor O. W. Richardson, of King's College.

Dr. Irving Langmuir, assistant director of the research laboratory of the General Electric Company and president of the American Chemical Society, has been chosen by the trustees of Columbia University to receive the medal of the Charles Frederick Chandler[1] Foundation this year. The Charles Frederick Chandler Foundation is a fund presented in 1910 to the trustees of Columbia University by friends of the late Professor Chandler, the income of which is used to provide a lecture by an eminent chemist and a medal to be awarded to the lecturer in further recognition of his achievements in science.

[1] Dr. Chandler held membership in the A. PH. A. from 1867 until his death, a few years ago.

DEAN CLAIR A. DYE, GUEST OF HONOR.

Pharmacy Week celebration in Columbus was made the occasion of an expression of good will and appreciation by members of Columbus Retail Druggists Association and of the Ohio Pharmaceutical Association to Dean Clair A. Dye. The College of Pharmacy of Ohio State University will soon have a building devoted entirely to pharmacy.

Lee W. Funk and Thomas J. Ryan divided honors as master of ceremonies and toastmaster. Addresses were made by Dr. Sylvester Goodman, who spoke on the relationship between physicians and pharmacists; Prof. Charles W. Foulke, who spoke on "Pharmaceutical Chemistry," and held that the art of the pharmacist is the oldest, if not the actual progenitor of all the sciences dealing with human health. Grant P. Ward and William C. Wendt, members of the General Assembly, talked on legislative matters, particularly with reference to the appropriation which gave the university its new pharmacy building. Other speakers were: Dean Edward Spease, of the College of Pharmacy of Western Reserve University; Dean Rudolph H. Raabe, of Ohio Northern University College of Pharmacy; Dr. A. C. Neal, of the Ohio State Board of Health and F. O. Taylor.

MEDICAL CONGRESS IN PANAMA.

Public health officials and prominent physicians and surgeons of North, South and Central America will meet in Panama City during the week of January 30th. The congress will hold its sessions in the Gorgas Institute. Health conditions in Panama are excellent and present a striking transformation from former conditions. There will be a display of hospital equipment, drugs and pharmaceutical preparations. Among the physicians and surgeons to be present are Charles H. Mayo, Simon Flexner, Lewllys Barker.

CONFERENCE OF THE INDUSTRIES AT U. S. CHAMBER OF COMMERCE.

On December 5th President Hoover opened a conference of the industries at the headquarters of the U. S. Chamber of Commerce; Secretary Lamont and Assistant Secretary Klein also were present. President Butterworth presided as Chairman. The drug and chemical trade was represented by officials of several of the organizations of the industry.

PERSONAL AND NEWS ITEMS.

Dr. K. K. Chen, widely known for his work on ephedras and ephedrine, much of it reported in the JOURNAL A. PH. A., has joined the scientific staff of Eli Lilly and Company as director of pharmacologic research. He relinquished the chair of associate in pharmacology at Johns Hopkins University medical school to take over his duties with the Lilly organization. Dr. Chen received his B.S. in pharmacy and his Ph.D. in physiology and physiological chemistry from the University of Wisconsin, and his M.D. from Johns Hopkins.

As has been reported in these columns, **Dr. Henry Hurd Rusby** was the recipient, on October 2, 1929, of the Hanbury Medal, presentation having taken place during the opening of the school of the Pharmacy of the Pharmaceutical Society of Great Britain. After the presentation, Dr. Rusby made the Inaugural Sessional Address to the School, his subject being "The Authentication of Materials Used in Scientific Research." At the Convocation in commemoration of the 175th anniversary of the founding of Kings College, on October 30, 1929, the degree of Doctor of Science was conferred on him.

Dean Rusby's friends in the Alumni Association of the New York College of Pharmacy, desiring to honor him and to show their appreciation of his merits in some public way, have sponsored a testimonial dinner, to be held on the evening of December 11, 1929, at the Hotel Pennsylvania, New York City.

Secretary E. L. Newcomb, of the N. W. D. A., has returned from a visit to various wholesale drug clubs in Southern Atlantic, Southwestern, Mississippi and Ohio Valley states. Meetings of the wholesale drug firms, representing different types of organizations, were held and were productive of a spirit of coöperation. Secretary Newcomb stated that the wholesalers feel that their interests, as well as those of retail druggists, will be best safeguarded by continuation of active and harmonious coöperation, each with the other.

Among the files of the Mercer Apothecary Shop in Fredericksburg a prescription was found that Dr. Mercer wrote for his friend Colonel Madison. A number of articles relating to General Mercer and his Apothecary Shop, which has been restored, have appeared during recent years in the JOURNAL. At the last annual meeting of St. Andrews Society, in Philadelphia, **Dr. F. E. Stewart,** one of its former presidents and also a past honorary president of the A. PH. A., carried the sword of General Mercer, a valued possession of this time-honored society.

The Board of Trustees of the New Jersey Pharmaceutical Association has announced that **Prescott R. Loveland** of Atlantic City, New Jersey, has been appointed by President Dudley Singer to succeed **Robert P. Fischelis** as secretary of the New Jersey Pharmaceutical Association. The latter will continue as Editor of the New Jersey Journal of Pharmacy, the official organ of the Association. Relief from the secretarial duties and the management of the business affairs of the *Journal* has been sought by Dr. Fischelis for some time because of his ever increasing duties as secretary, and chief chemist of the Board of Pharmacy of the State of New Jersey and other activities. Mr. Loveland has been a member of the Association since 1906 and has been a frequent contributor to pharmaceutical journals. He has had wide experience in the retail drug business and understands the problems of the practising pharmacist from actual contact with them. The secretary's office will henceforth be located at 2627 Pacific Ave., Atlantic City.

J. B. Pilchard is now the secretary-treasurer of Pennsylvania Pharmaceutical Association, succeeding J. G. Noh, who resigned several months ago. Mr. Pilchard is a graduate of the Philadelphia College of Pharmacy and Science and has had extended pharmaceutical experience during the past three years, on the Pacific Coast.

Editors and representatives of various drug publications recently were guests of Hoffmann-La Roche, Inc., at their new plant in Nutley, N. J. The visitors were received by its officers and then conducted through the offices and library. After luncheon inspection was made of the manufacturing divisions.

ANNUAL MEETING OF THE NATIONAL DRUG TRADE CONFERENCE.

The annual meeting of the Drug Trade Conference was held in Washington, December 12th. All of the organizations having affiliated in the Conference were represented and much important business was transacted. Plans were made for defining poisons—by definitions applying to the drug, and not in general terms. A valuable educational report was submitted by the Committee on the General Status of Pharmacy, which was profitably discussed.

The fact that all divisions of the drug-trade activities participated enhanced the value of the report and a number of the suggestions will find application in properly balancing the added years of pharmacy courses. The Conference is on record in favor of the Pharmacy Corps in the Medical Department of the U. S. Army. A report of the Conference meeting must be left for printing in a succeeding issue of the JOURNAL.

CERTAIN PORTIONS OF THE NEBRASKA PHARMACY LAW INVALID.

The points raised in the appeal from the District Court were considered by the Supreme Court in the decision as set forth in the syllabus of the case, as follows:

1. The police power is an attribute of state sovereignty, and, within the limitations of State and Federal constitutions, the state may, in its exercise, enact laws for the promotion of public safety, health, morals, and generally for the public welfare.

2. The legislature may not, under the guise of police regulations, arbitrarily invade personal rights or private property.

3. A law which restricts to registered pharmacists the sale of such articles as salt, soda, soap, distilled water, corn starch and other useful but harmless articles, does not tend to promote the public health or welfare, but tends to place in the hands of a limited class a monopoly of the sale of such articles. Such an act is beyond the scope of the police power and is invalid.

4. In so far as Chapter 167, Laws 1927, limits to licensed pharmacists the sale of all articles listed in the United States Pharmacopœia or National Formulary, it transcends the police power and is invalid.

SALE OF POISONS IN NEW JERSEY.

New Jersey pharmacists have been warned that poisons must be labeled with a red label bearing the name of the article in English and the word "poison" as well as the name and place of business of the dispenser. The name of the manufacturer is not sufficient.

CHLOROFORM TOXICITY.

Experiments on the removal of poison from chloroform by H. Fühner are reported in *Deut. med. Wochnschr.*, 55, 1331 (1929), No. 32.

Death due to chloroform-anesthesia is probably caused by the oxidation products of chloroform forming in the organism rather than the chloroform itself. Its decomposition to phosgene and hydrochloric acid takes place more quickly, the purer the compound. Pharmacological experiments showed that addition of 10% alcohol lowers the boiling point of chloroform and renders it more stable and less injurious to the organism. Administration of 20% alcohol, or an alcoholic beverage of that concentration to man before the induction of anesthesia in an amount sufficient to produce drowsiness and euphoria increases the stability of chloroform and renders its administration in lesser quantities possible. It has been found that anticatalytic agents such as cysteine, possibly insulin or mannit ($C_6H_8(OH)_6$) and dihydroxyacetone, or a special diet, *e. g.*, oatmeal, retard the oxidation process of chloroform and increase the resistance of the patient to its after-effects. —T. H. *Squibb Abstract Bulletin*, August 28, 1929.

VITAMINE B COMPONENTS.

WATER-SOLUBLE VITAMINES AND THEIR RELATION TO EACH OTHER.[1]

Goldberger and his followers conceived the thermolabile water-soluble beriberi-preventing substance (B), and the thermostabile water-soluble, pellagra-preventing substance (P. P. factor) as constituents of vitamine B. Presence of the two substances with a sufficient amount of liquid-soluble vitamins in a diet keeps young rats in good health. While deficiency of one precipitates the disease which it prevents, complete absence of water-soluble vitamins results in the death of the animals. The histological findings showed symptoms resembling those of scurvy. Consequently the B, and P. P. factor separately and together prevent scurvy-like symptoms and are constituents of vitamine C and not of vitamine B in the opinion of the author. It has been observed that addition of yeast (fresh or autoclaved) and of phosphocrescin, a dried vegetable extract, to the diet promoted the growth and health of young rats. Alkaline hematin and deuterohemin, produce beriberi in large doses and more in small doses, therefore possess the pellagra-preventing factor of Goldberger. Practical experiments and curves illustrating the above statements are given.—T. H.

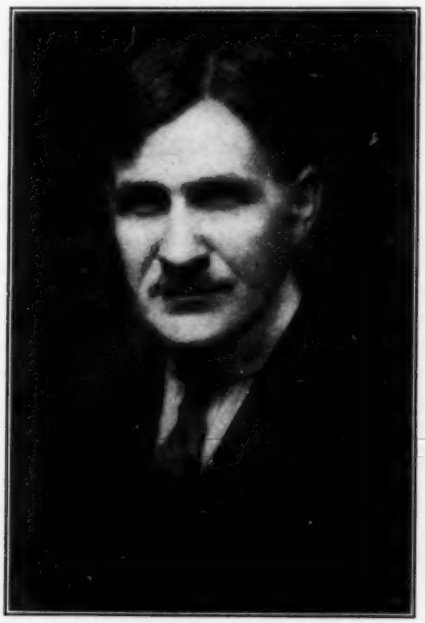
---

[1] W. Kollath,—*Arch. exptl. Path. Pharmakol.*, 142 (1929), 86; through *Squibb Abstract Bulletin*.

OBITUARY.

PHILIP HENRY UTECH.

The sad news of the death of P. Henry Utech, of Meadville, Pa. came as a shock, because of the suddenness of his passing. Mr. Utech had closed his pharmacy on the night of November 21st and was making his way to the bus for his home when the call came. He was taken into Easterwood's pharmacy where every attention possible was given him. According to the report the deceased had suffered with a heart trouble, but recently he had been free from its inconveniences and, perhaps, was over-confident about his improved condition. The news item indicates that since



P. HENRY UTECH.

his return from Rapid City several new duties had been accepted by him and these responsibilities weighed too heavily on him, because of the condition referred to.

Our late fellow-member became a member of the ASSOCIATION in 1907, and since then has been active in its promotions—he was a member of the N. F. Revision Committee and of the Committee on Pharmaceutical Recipe Book. In 1910, he was elected secretary of the Section on Practical Pharmacy and Dispensing and in the year following to the chairmanship of the Section. He served as chairman of the Section on Commercial Interests, 1916–1917, and held important committee appointments during most of the years of his membership.

Mr. Utech graduated from the Philadelphia College of Pharmacy in 1893; he was a past-president of Pennsylvania Pharmaceutical Association and served in a number of important offices and on committees of the Association.

The deceased had been successful as a pharmacist in Meadville and took an active interest in matters pertaining to the city. He gave support and encouragement to many organizations, including the Zion Evangelical Church, the Pennsylvania College of Music, of which he was president and director; the Round Table, the Associated Charities, the Meadville Art Association, the City Planning Commission, the Chamber of Commerce and other local activities.

Among those present at the funeral from outside of Meadville and vicinity were former presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION, Samuel L. Hilton, of Washington, D. C. and Julius A. Koch, Pittsburgh, Pa. Mrs. Hilton and Mrs. Koch, and Mr. and Mrs. J. C. Peacock, of Philadelphia, also attended the services.

Mrs. Utech, who survives her husband attended the pharmaceutical association meetings with him. The ASSOCIATION shares in the loss sustained and extends sympathy to the widow in her bereavement. A memorial service, at the church of which the deceased was a member, evidenced the esteem in which he was held by his townspeople, all the pews of the church being filled. The AMERICAN PHARMACEUTICAL ASSOCIATION has lost an active and loyal member.

TRIBUTE OF THE NATIONAL FORMULARY COMMITTEE IN MEMORY OF PHILIP HENRY UTECH, 1873–1929.

"The notice of the sudden death of Philip Henry Utech, Meadville, Pa., November 21, 1929, came to his associates and many friends as a most overwhelming shock.

"The members of the Revision Committee National Formulary V are grieved to record the decease of their fellow member and co-worker who rendered valuable assistance and excellent work during the last revision, his energies and interests pertaining to revision work in connec-

tion with the National Formulary and also the Recipe Book made him a prominent worker for the advancement of professional pharmacy.

"He conducted his business on the same high plane and was always deeply interested in and contributed largely of his time and money for the advancement of all community interests. He will be greatly missed by his associates and numerous friends.

"It is proper, therefore, that the National Formulary Committee enter upon its records this appreciation of his valuable work and express its deepest regrets at the great loss sustained. A copy of this memorial[1] is to be forwarded to his widow."

GEORGE T. RIEFFLIN.

George T. Riefflin—member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1909, and New York City sales representative of Sharp & Dohme for many years—died after a day's illness, November 18th, in Mt. Morris Park Sanatorium. The deceased was a native of West Prussia, where he was born September 19, 1854.

Mr. Riefflin had been looking forward to the concluding evening concert in Steinway-Hall on November 19th, by his gifted daughter, Miss Elsa Riefflin. The many friends of the family who intended to join in the evening's entertainment, sorrowfully paid last honors to their departed friend.

Mr. Riefflin was one of the organizers of the Steuben Society in which he was deeply interested; officers and members of the Society paid tribute to their fellow member.

The deceased was a member of a number of other societies and organizations; among them, the German Apothecaries' Society, the Turn-Verein and the Veteran Druggists' Association; Dr. Carl F. Schleussner spoke for the latter and Nathaniel Nicolai for the former. Representatives of the organizations in which Mr. Riefflin held membership were present to do honor; also, members of the staff of *New Yorker Herold*, Editor Hugo Kantrowitz of the *Apotheker-Zeitung;* President Pincus Herz, of N. Y. Pharmaceutical Association, Dr. J. Leon Lascoff and many other friends and co-workers who esteemed him as a friend, for his high ideals, his strong and genteel character. Sympathy is expressed to the widow and daughter.

[1]The Committee on Revision of National Formulary—the tribute was prepared by S. L. Hilton and submitted by former Secretary Wilbur L. Scoville.

FREDERICK WILLIAM ARCHER.

Frederick William Archer, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died October 17th, following an illness of more than a year. The deceased had been engaged in the retail drug business in Dorchester, Mass. (Boston), for more than fifty years. He was a member of the Boston Association of Retail Druggists and of the N. A. R. D.

Mr. Archer had been a member of the Massachusetts Board of Pharmacy, and was a member of the Board of Trustees of Massachusetts College of Pharmacy. He took an interest in municipal affairs and was an incorporator of the Milton Savings Bank and of the Dorchester Savings Bank. His widow and two sons, Harold D. and Charles F., survive the deceased. The latter is a retail pharmacist at 573 Talbot Ave.; his father's store is located at 2297 Dorchester Ave.

Sympathy is expressed to the bereaved.

EMERSON R. MILLER.

Emerson R. Miller, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1895, died at Mayo Hospital in Rochester, Minn., October 31st. Dr. Miller established the School of Pharmacy at Auburn, Ala., thirty-four years ago and has been connected with this Institution, excepting during the years of his post-graduate work at European universities, and while engaged at the University of Wisconsin, at Minnesota and the Cuban Experiment Station, at Santiago.

Dr. Miller was quite a frequent contributor to the JOURNAL OF THE A. PH. A. The last article published was on "Cornin: a Glucoside from *Cornus Florida*."

Dr. Miller was extremely modest, highly regarded by co-workers, students and fellow citizens.

At the end of the last school term the deceased was given leave of absence on account of the necessity for surgical treatment. Mrs. Miller died several years ago.

FREDERICK FRANK WITTING.

We regret not to have had earlier advice of the death of Fred. F. Witting, which occurred at the home of his son, Theodore, in Denver, on July 9th, as a result of injuries he sustained when struck by an automobile. Mr. Witting was born in Ohio in 1854. His family moved to St. Louis when he was quite young and that city was his home until he came to Denver in 1882. He graduated from

the St. Louis College of Pharmacy in 1875. He owned a drug store at 26th Ave. and Humboldt St. in Denver for many years, and afterward went to Longmont, where he operated a store until about 1918. The deceased became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1902.

CHARLES PFIZER.

Charles Pfizer, son of the founder of Charles Pfizer & Co., New York, died October 6th at his home in Bernardsville, N. J., aged 68 years. His brother, Emile Pfizer, is president of the chemical company. His wife, two sisters and brother survive.

W. H. PERKIN.

William Henry Perkin, F. R. S., Waynflete Professor of Chemistry at Oxford, died on September 17th, aged 69 years. He was the eldest son of Sir William Henry Perkin, the founder of the coal-tar dye industry. Upon completing his chemical studies in Germany, he was appointed professor of chemistry at the Heriot-Watt College, Edinburgh, where he inaugurated his great experiments upon the alkaloids, beginning with berberine. In 1892 he was elected professor at Manchester University, where he remained until his appointment, in 1912, to the Waynflete Chair at Oxford.

MRS. P. J. GARVIN.

Mrs. P. J. Garvin, wife of our fellow member, P. J. Garvin, died November 30th. The esteem and love for Mr. and Mrs. Garvin were expressed by floral tributes and attendance at the funeral services by many representatives of various organizations and the drug trade activities from all parts of Connecticut. As is known to our readers, Mr. Garvin is secretary of Connecticut Pharmaceutical Association and State Pharmacy Inspector. Sympathy is expressed to the bereaved.

BOOK NOTICES AND REVIEWS.

Organic Chemistry for Students of Pharmacy and Medicine. By A. H. CLARK, Professor of Chemistry, University of Illinois, School of Pharmacy. D. Van Nostrand Company, Inc. 8 Warren St., New York, 1929, 446 pages, cloth, $5\frac{1}{2} \times 8\frac{1}{2}$. Price $3.50.

In the preface of the book, the author states in part, "In this volume an endeavor has been made to present such theory as is needed for an understanding of medicinal products and to include a description of many such products not mentioned in the usual texts.... Subjects, such as dyes, industrial organic chemistry, many of the important type reactions for the synthesis of organic compounds, etc., are conspicuous for their absence, or are very briefly touched upon.... Therapeutics is lightly touched upon. The very interesting field of the relationship of chemical constitution to physiological action is also passed over lightly, it being intentionally left for the individual teacher to deal with as he sees fit." This quotation indicates the scope of the work. The reviewer does not agree with the author in his conclusion that students of pharmacy and medicine require less knowledge of the fundamental theory and basic type reactions of organic chemistry than do other students of science. The text material is largely descriptive.

The book is divided into three parts as follows: Part I deals with open-chain hydrocarbons; Part II treats of the aromatic compounds, volatile oils, alkaloids, etc.; and Part III is given over to synthetic medicinal agents. In Part I, various products derived from the aliphatic hydrocarbons are described, *i. e.*, unsaturated hydrocarbons, petroleum products of commerce, esters, waxes, lipoids, carbohydrates, gums, proteins, etc. Part II includes a description of cyclic compounds such as benzene and its homologues, aromatic sulphonic, halogen and nitroderivatives, aromatic acids, volatile oils, alkaloids and related substances, glucosides, resins, etc. Part III takes up the synthetic derivatives and other medicaments under different chapter headings such as, hydrocarbons, chlorine compounds, iodine compounds, phenolic compounds, quinoline derivatives, arsenicals, mercurials, etc. The structural formula of almost every compound mentioned is given with a brief description of the properties of the compound. In a very few cases, the reactions involved in the synthesis of a compound are shown. Seldom are the properties of a compound illustrated by the reactions which it takes part in when treated with various reagents.

A knowledge of organic chemistry consists, in the writer's opinion, of knowing how a sub-

stance of a given formula will react under different conditions. In other words, it consists of a knowledge of the reactions of organic chemistry. It is of little value to have available or know numerous structural formulas unless one knows how to use them.

The descriptive matter might be improved by eliminating the loose terminology employed which is often confusing, *e. g.*, page 278, "Amygdalin is found in large quantities.....;" page 280, "A number of things have been called digitalin;" page 26, "This is 4, 2 methylpentene. As in all cases of this kind where two things are located by numbers the order in which the numbers are given must be the same as that in which the things are named."

The introduction of a comparatively detailed discussion of the volatile oils, their occurrence, methods of isolation, most important constituents, properties and the similar treatment of the glucosides, tannins, alkaloids, etc., is especially commendable since most textbooks of organic chemistry pass over these subjects which are very important to the student of pharmacy and medicine with slight consideration. In like manner, a great number of synthetic medicinal products are discussed. An insight into the subject matter covered in this portion of the work may be gained from the following paragraph headings selected at random: "Sejodin," "Thymol Iodine," "Thyroxin," "Thymol Carbonate," "Spiracin," "Saloquinine," "Intarnin," "Bromural," "Acridine," "Neoarsphenamine," and "Mercurochrome 220 Soluble." Generally, the structural formula and a brief description of the synthetic product are given and frequent reference is made to the descriptive matter contained in the U. S. P., N. F. and N. N. R. Approximately two hundred of the more recent remedial agents are taken up in this part of the book.

The book is well printed on a good quality of paper and well bound.—GLENN L. JENKINS.

Practical Materia Medica. By CLAYTON S. SMITH AND HELEN L. WIKOFF; Lea and Febiger, 300 pages, $3.25. The book, prepared by the professor and instructor of physiological chemistry and pharmacology in the College of Medicine of the State University, Columbus, Ohio, represents an introduction to the study of pharmacology and therapeutics for medical students.

The names, preparations, their administration, the doses and the chemistry of the official drugs are discussed in a general way in the Materia Medica (1), (2); Toxicology (3); Prescription Writing (4). In the appendix we find a discussion of reagents and test solutions.

The metals, acids and non-metallic elements are grouped together and the aliphatic and aromatic series, the terpenes, carbohydrates, glucosides, fats, aliphatic nitrogen compounds and alkaloids. Under toxicology the poisonous drugs are assembled, as corrosives, irritants and neurotics, but they are individually discussed under the classification of volatile poisons, non-volatile organic poisons and metallic poisons.

The authors, admittedly, have freely used the U. S. P., the N. F. and standard texts on organic and physical chemistry. Knowledge given is fairly up-to-date, though no specific reference is made to colloidal solutions, to the latest work on the chemistry of important drugs, as digitalis, the synthesis of thyroxin, the use of copper in anemia, etc. Surprisingly, senna is not mentioned among the emodin-bearing drugs, nor is ergosterol or any of the vitamines other than vitamine A of cod liver oil emulsions, nor all the hormones and important toxins. It appears hardly justified to include juniper and such spices as mustard, nutmeg and rosemary under the poisonous drugs, as done by the authors in their classification.

A glossary would appear to be a helpful addition in an elementary book of this kind. Pharmacists, interested in the graduate study of medicine have the advantage of a more extended training than is given to medical students through books of this limited scope. Nevertheless the book will prove suggestive and helpful in review work. Paper, print and binding are good.—ARNO VIEHOEVER.

Aids to Pharmaceutical Latin. By G. E. TREASE. Published by Baillere, Tindal & Cox. Price 3s., 6d. The author is a lecturer in pharmacognosy at University College, Nottingham, and joint author of "The Chemistry of Crude Drugs." The book is really a concise Latin grammar and written with the needs of the physician and pharmacist in mind. The list of abbreviations used in prescription writing is quite complete and also the phrases. In prescription writing and dispensing it will be found of value to the physician and in the drug store, and particularly, in the teaching of Latin to medical and pharmacy students in the use of such terms in prescription writing.

Handbook of Pharmacognosy. By OTTO A. WALL, M.D., Ph.G., revised by Leo Suppan, Ph.G., B.Sc., Professor of Botany and Pharmacognosy in the St. Louis College of Pharmacy. Fifth Edition. 472 Pages, 407 figs. Published by The C. V. Mosby Co., St. Louis, 1928. Price $5.00.

The first edition of this book appeared in 1917; that within eleven years a fifth edition becomes necessary speaks well for the plan followed in this presentation of pharmacognosy. The drugs are taken up much the way advocated by the reviewer (see JOUR. A. PH. A. XVII (1928), 292–295), not from the standpoint of an evolutionary sequence, but from a strictly morphological one. Thus, leaves are taken up first, next leaf buds, then flowers, fruits, seeds, herbs, roots, etc., etc. The descriptions for each drug are short and concise, seldom covering more than a page of space, and illustrations are abundant. The author lives up to the statement, that the book is to serve merely as a skeleton, and only the absolutely essential of each drug is given. It is rather too bad that, in a work so well conceived, there should be any derogatory criticism, most of which could have been avoided by a more careful revision.

(1) The author contends that, for the beginner in pharmacognosy, the identification of drugs by their physical characteristics is sufficient; notwithstanding, the author goes far more into the microscopic structure than this premise should permit. Practically all that is stated on pages 23–38, under the caption "Vegetable Histology," might well be omitted; likewise, what is stated on pages 189–216, on the "Structure of Roots and Stems." Little of this is required in the identification of drugs by their physical characteristics. Furthermore, all of this the student will get in any good course in botany or vegetable histology.

(2) Notwithstanding the author's contention, that as a pharmacognosist, one is not interested in the question whether a drug is official or not, the reviewer believes that the book would be improved by a statement after each drug, as it is taken up, whether it is a U. S. P. drug, an N. F. drug, etc. There should appear, at any rate, under N. (Name), the Latin name, the English name and the synonyms given in the Pharmacopœia for each U. S. P. drug, and those given in the National Formulary, for each N. F. drug. The author is not always consistent in selecting his names, notwithstanding that on page 19, he states, that under this head come the Latin name, meaning thereby the pharmaceutical title, the scientific English name, and then the more extensively used English names or synonyms. He frequently omits the Latin name; thus, under XANTHOXYLI FRUCTUS, page 118, he gives first a synonym, not recognized by the N. F., and then the English name; under CASSIA FISTULA, page 116, he gives only the synonym; under VANILLA, page 115, only the English name, etc., etc. Or, he gives the Latin name and omits the English name or the synonym, thus under CORIANDRI FRUCTUS, page 121, he gives the Latin name and the English name, but omits the synonym; likewise for FOENICULI FRUCTUS, page 124. Under APII FRUCTUS, page 125, he gives "Apium," as its Latin name and its synonym, but does not give its English name. Under "STRAMONII FOLIA," there is no mention that its Latin name is STRAMONIUM, as also its English name; the four names given are all synonyms, yet he does not mention Jamestown weed, which is a synonym recognized by the U. S. P. There are a great many of these so-called "inconsistencies."

(3) There are a great many misspelled words, some of them no doubt typographical errors, which careful proof reading would have eliminated. Since the student is not able to detect them, it makes errors of this kind especially unfortunate. The following are some of the more marked errors of this kind; on page 48, "Ericaceoe,' instead of *Ericaceæ;* on page 49, "Erythroxylaceoe," instead of *Erythroxylaceæ;* on page 54, "Rosmarinus officinalas" for *R. officinalis;* on page 104, "Rubus Idoeus" for *R. Idaeus;* on page 128, "Chilies" for *Chillies;* on page 189, "Euphorbraceae" for *Euphorbiaceæ;* page 244, "Panax quinquefolius" instead of *P. quinquefolium;* page 259, "Athaea" for *Althæa;* page 274, "Lilaceæ" for *Liliacæ;* page 300, "Scopola" for *Scopolia;* page 310, "ERIODYCTION" for ERIDICTYON; page 364, "Thymelaceæ" for *Thymelaeaceae;* page 376, "Aquæfoliaceæ" for *Aquifoliaceae;* page 396, "Hippocreaceæ" for *Hypocreaceæ;* page 398, "Polyporpus" for *Polyporus;* page 400, "Dryopteris Felix mas" for *D. Filix-mas.*

(4) *Errors in capitalizing or not capitalizing specific names.* In some cases, perhaps, there may be a difference of opinion; upon the whole, however, one must follow the rules set down for the guidance of botanists in this matter, or at least follow the examples set in the U. S. P., and the N. F., unless they are unmistakably

in error. Such names as Canadensis, Americana, Gallica, Sinensis, Virginica, Californica, etc., etc., used as specific names are adjectives, and adjectives in Latin are written with small letters; the author has written them all with capitals. Among the errors of this kind, he has on page 436, *Fagus Sylvatica* instead of *F. sylvatica*. On the other hand, some of the specific names still capitalized, he fails to capitalize, thus on page 64, *Datura tatula* should be *D. Tatula*, and on page 65, *Verbascum thapsus* should be *V. Thapsus*. Generic names are always capitalized and so on page 328, *graphis elegans* should be *Graphis elegans*. Here, too, it may be well to call attention to page 118; the name of the plant, according to many authors, is not Xanthoxylum, but Zanthoxylum; and on page 395, the botanic source of the drug is not *Sticta pulmonacea*, but *Lobaria pulmonaria*.

(5) *Non-conformities, sometimes mistakes, and omissions.* On page 63, *Hamamelis Virginica* should be *H. virginiana*. On page 64, why not use "STRAMONIUM," instead of "STRAMONII FOLIA?" And why not conform with the U. S. P. which does not recognize *Datura Tatula* as one of its sources? On page 119, under "LAPPAE FRUCTUS," the fruit of *Lappa officinalis*, should be the fruit of *Arctium Lappa*, which is also the source of LAPPA, as the author recognizes on page 260. On page 226, under "GLYCYRRHIZA," the author states this is the root of *Glycyrrhiza glabra* and *G. glandulifera;* the U. S. P. states it is the rhizome and roots of *G. glabra* v. *typica* or of *G. glabra* v. *glandulifera*. On page 243, we note "ANGELICA," why not ANGELICAE RADIX as in the N. F.? The N. F. recognizes rhizome and root of *Angelica Archangelica* and other species of *Angelica;* the author states root of *Archangelica officinalis* and other species of *Archangelica*. On page 303, under CORYDALIS, the author states, the tubers of *Dicentra Canadensis;* the N. F. states, the tubers of *D. canadensis* or *D. Cucullaria*. On page 345, the "Cinchona" described by the author is not CINCHONA, U. S. P. He should, in some place, make note of this; likewise, on page 348, the "Cinnamomum" described is not CINNAMOMUM U. S. P., the latter being described as *Cinnamomum Saigonicum;* here again, there is no statement to guide the student. On page 359, the author states that Berberis is the bark of Berberis vulgaris; the name "BERBERIS" should be reserved for the N. F. drug, which he in no place describes. On page 389, under "Galla," the insect causing the excrescence is described as *Cynips Gallae tinctoriæ*, most authors call it *Cynips tinctoriæ*. Under FUCUS, page 393, the author fails to mention *Fucus serratus*, and *F. siliquosus*, as also sources of the drug. On page 417, the author uses "Saccharum" as a Latin name for sugar. It should be replaced by SUCROSUM, a name he fails to mention at all. On page 430, Shellac is not a substance exuded from various plants in consequence of the stings from the female insects of *Coccus Lacca*. On page 432, he states that COPAIBA is obtained from "Copaifera Langs—dorfii," and other South American species of *Copaifera Copaiba*, instead of species of *Copaiba* as advocated by the U. S. P. Copaiba is also the English name advocated by the U. S. P., hence "Para Copaiba" and "Maracaibo Copaiba," and not "Copaiva." On page 436, *Betula alba* does not belong to the *Cupuliferæ*, but to the *Betulaceae*, neither does *Fagus sylvatica* belong to it, but to the *Fagaceæ*. On page 453, LACTOSUM is not mentioned, but the drug is described under its former title "Saccharum Lactis." At no place do I find a description of Cocillana, Dextrosum, Tyroideum, Pituitarium, Vaccinum Variolae, Antitoxinum Diphthericum, or of Antitoxinum Tetanicum.

(6) There are also botanical inaccuracies; thus on page 128, Pepper is described under Fleshy Fruits or Berries, since it is a drupe, it should have been described under Drupes; likewise on page 139, under White Pepper, Pepper is described as a berry. On page 135, Pimenta is described as a drupe, and on page 137, Solanum is described as a drupe, both are berries. On page 197, the author speaks of a nucleus sheath, why not use endodermis? And on page 213, no attempt is made to explain anomalous structure, and he simply calls the rings of growth, "spurious rings."

(7) No attempt has been made to criticize any of the other findings, as Habitat, Description, Constituents, Uses and Dose. These are, with the exception of what he states as constituents of ERGOTA, for the most part, probably correct.—CHARLES C. PLITT.

International Health Year-Book, 1928. Fourth Year. Reports on the Public Health Progress of 29 Countries (35 Public Health Administrations) in 1927. (L. of N. 1929. III. 6.) 1175 pages. Cloth. World Peace Foundation, American Agent, Boston, Mass. Price, $6.00.

The Health Organization of the League of Nations has just published its International

Health Year-Book for 1928. This is the fourth volume of this publication, and it contains information concerning twenty-nine countries: Australia, Austria, Belgium, Canada, Czechoslovakia, Denmark, Dominican Republic, Egypt, Esthonia, Finland, France, Germany, Hungary, Irish Free State, Italy, Japan, Latvia, the Netherlands, Norway, New Zealand, Panama, Poland, Roumania, Spain, Spanish possessions in the Gulf of Guinea, Sweden, Turkey, Union of Socialist Soviet Republics, United Kingdom (England, Wales, Scotland, Northern Ireland, Keny, British Somaliland, Tanganyika).

The object of the Year-Book is to give a survey of the progress made by the various countries in the domain of public health. It indicates new developments in the working of the various health services, gives the most recent data as regards vital and health statistics and reviews the work of the principal international organizations dealing with public health, such as the League of Red Cross Societies, the Rockefeller Foundation and the League Health Organization.

The information contained in the Year-Book is furnished by the heads of national health services or persons deputed by them for this purpose. (In our opinion the statement given relative to the number of drug stores in the United States at about 80,000 is excessive; about 60,000 is, probably, nearer the number of stores.)

The twenty-eight standard tables are designed to present the minimum of vital statistics necessary to allow the reader to "interpret correctly the information relating to health conditions in the country under consideration, and to compare the health conditions of the various countries."

The twenty-eight tables fall into the seven following groups: General Demography, Birth Rates, General Death Rate, Causes of Deaths, Infant Mortality, Public Health Statistics, Data on Curative Medicine.

The book will be found a valuable addition to libraries because of the data reported.

Botany. By WILLIAM J. ROLLINS AND HAROLD W. RICKETT. D. Van Nostrand Co., New York, 1929. 535 pages, 382 illustrations, 101 book references. Price $3.75.

In 27 chapters we find an interesting discussion of cells and tissues, their contents, growth and function, of origin and meaning of life, relations, energy of representative groups of lower and higher plant life, their vegetative and sexual life cycle, inheritance, evolution and distribution.

"In spite of the many excellent textbooks available on botany and allied subjects," as the authors admit, they have prepared the elaborated course of lectures, given at the University of Missouri, in an attempt "to present the fundamental biological principles rather than to lay the foundation for professional botany, and to give a correct idea of the true nature of the aim of science, its methods of work, and the value and limitations of its results."

To illustrate the author's treatment we quote from the chapters of reactions of plants. "'Teleology is a very human point of view and we do many things with purpose; and we assume that the things which a plant or animal does are also caused by purposes.... It must be emphasized that science cannot deny the possibility that plants have wills and purposes, and that they govern its life, or that there is some all-knowing Power directing their activities. Teleology may represent, for all we know, the truth; but it is unscientific nevertheless, because it assumes things for which there is as yet no evidence in the sense of observable or demonstratable facts. Therefore we must avoid it in biology—the scientific consideration of life. We must give as reasons for structures and functions only known causes; and we must be prepared, when we cannot find the cause, frankly to admit our ignorance—and to go on looking for one."

Curiously we find no reference to lignin, so characteristic of all woody tissue, of hemicellulose, mucilage and the callose of sieve tubes. We also feel, with regret, that biochemistry and biophysics have not been given more place as they form such an integral part of modern biological science.

Appended is a questionnaire of over 500 questions for review and discussion which will prove helpful to the student who all too frequently is at a loss to formulate his own questions and to determine the extent of his understanding and knowledge.

The book will prove suggestive to the teacher of botany or biology—and be welcomed by students of plant life.—ARNO VIEHOEVER.

BOOKS RECEIVED.

Notice of books received is given in this department and such acknowledgment if not otherwise made is to be regarded as a sufficient

return for the courtesy of the sender. Selections will be made for more extended review in the interest of our readers, as space permits.

Reviews are prepared at the request of authors and publishers of books and the reviewers are selected with the purpose of being helpful. The reviews represent the conclusions of the reviewers and are written by them after careful reading of the books which requires of them time and study.

Reviews will appear in succeeding issues of:

Chemical Dictionary, by INGO W. D. HACKH.

Notice will also be made of *Youngken's Laboratory Manual of Botany.*

Materia Medica and Therapeutics Including Pharmacy and Pharmacology, by REYNOLDS WEBB WILCOX, Publishers P. Blakiston's Son & Co., Philadelphia. Price, $5.00.

Applied Pharmacology, by A. J. CLARK, Professor of Materia Medica and Pharmacology of the University of Edinburg. Publishers P. Blakiston's Son & Co., Inc. Price, $4.00.

N. C. CHAIN STORE TAX VALID.

When a person or corporation operates, under the same general management, supervision, or ownership, two or more stores or mercantile establishments where goods, wares and merchandise are sold or offered for sale at retail, a license tax of $50 on each store operated in the state in excess of one is valid and constitutional.—Great Atlantic & Pacific Tea Company *et al.* v. Maxwell. (N. C. Superior Ct. of Wake County.)—IV. *U. S. Daily.*

OFFICERS OF DRUG TRADE BUREAU OF PUBLIC INFORMATION.

The Drug Trade Bureau of Public Information held its annual meeting in Washington on December 12th. Plans were laid for the year and the following officers were elected: *President*, Ambrose Hunsberger, Philadelphia; *Secretary-Treasurer*, H. C. Christensen, Chicago; *Director*, Robert P. Fischelis, Trenton.

COMMITTEE N. D. T. C. CONFERRED WITH CONGRESSMAN PORTER.

The National Drug Trade Conference, on suggestion of Congressman Porter, appointed a committee to confer with him on his plans for narcotic legislation. The Committee—consisting of Samuel C. Henry, Carson P. Frailey, W. L. Crounse, A. G. DuMez and James H. Beal—met with Mr. Porter and he requested further suggestions. The Committee will submit a report and suggestions on the bill to Mr. Porter next week.

The officers of the National Drug Trade Conference were reëlected for the ensuing year.

DR. H. H. RUSBY RESIGNS AS DEAN, NEW YORK COLLEGE OF PHARMACY.

Dr. H. H. Rusby, for many years dean of New York College of Pharmacy, announced his resignation as dean at the dinner given him by the Alumni. Tributes were paid the guest of honor, and messages came from prominent pharmacists and scientists. Dr. H. V. Arny, Dean Rusby's "right hand man," succeeds his friend and co-worker.

Dr. Rusby will continue his work as member of the faculty and the change of deanship will become effective in June. The Board of Trustees adopted resolutions of high regard and appreciation.

CHARLES AUGUSTUS WOLF.

Charles A. Wolf member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1906, and engaged in retail pharmacy in Baltimore for more than fifty years, died November 23rd, aged 72 years. Mr. Wolf graduated in the class of 1878 at the Maryland College of Pharmacy. He was highly regarded by his coworkers and patrons. His son, Dr. J. Carlton Wolf, is also a pharmacist and a member of the faculty of the University of Maryland School of pharmacy. The latter also is a member of the A. PH. A. The deceased is survived by his widow and a son to whom sympathy is expressed.

HENRY BROOKE GILPIN.

Just before completion of this issue of the JOURNAL we are advised of the death of Henry B. Gilpin, at Union Memorial Hospital, Baltimore (December 17th), aged 76 years. The deceased was a former president of Henry B. Gilpin Company and associated with the drug industry of Baltimore for many years. He became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1889, in the progress of which he was deeply interested. He was a former president of Maryland Pharmaceutical Association.

For the past few years Mr. Gilpin lived on his country estate near Boyce, Va., where funeral services were held. Sympathy is expressed to the family.

COMBAT PNEUMONIA

PNEUMOCCUS ANTIBODY SOLUTION

EARLY USE REDUCES MORTALITY—SHORTENS DURATION OF THE DISEASE. Every hour is of value in pneumonia treatment.

IT CONTAINS THE SPECIFIC ANTIBODIES for Types I, II and III pneumococci in the purest form generally available.

WHEN USED EARLY (on or before the third day) a definite shortening in the duration of the disease and a reduction in the mortality rate is reported.

TYPING as a preliminary procedure is unnecessary and causes delay.

THE DANGEROUS BACTEREMIA accompanying many cases of pneumonia can often be controlled, especially in Type I cases.

THERMAL REACTIONS may sometimes occur and by many are regarded of favorable therapeutic significance, if not severe. Severe reactions, though rare, require active and prompt measures for their control.

INTRAVENOUS ADMINISTRATION is the only method endorsed by those who have used the Solution extensively. The antibodies apparently are not available when injected subcutaneously.

Supplied in 50 cc containers ready for intravenous use.

H. K. MULFORD COMPANY

PHILADELPHIA, U.S.A.

85268

AMERICAN PHARMACEUTICAL ASSOCIATION

OFFICIAL ROSTER FOR 1929-1930

(Addresses of all members will be found in the Year Book.)

OFFICERS OF THE ASSOCIATION.

President, H. A. B. Dunning, Chase and Charles Sts., Baltimore, Md.
Honorary President, E. V. Zoeller, Tarboro, N. C.
First Vice-President, A. L. I. Winne, 712 State Office Bldg., Richmond, Va.
Second Vice-President, W. B. Goodyear, 1901 Derry St., Harrisburg, Pa.
Secretary, E. F. Kelly, 10 W. Chase St., Baltimore, Md.
Treasurer, C. W. Holton, Box 81, Essex Fells, N. J.
Editor of the Year Book, A. G. DuMez, Lombard and Greene Sts., Baltimore, Md.
Editor of the Journal, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

Officers-Elect.—*President*, H. C. Christensen, Chicago, Ill.; *First Vice-President*, Walter D. Adams, Forney, Texas; *Second Vice-President*, D. B. R. Johnson, Norman, Okla.; *Members of the Council*, H. V. Arny, New York; T. J. Bradley, Boston, Mass.; William B. Day, Chicago, Ill.

THE COUNCIL.

Elected Members.—H. V. Arny, 115 W. 68th St., New York, N. Y. (1930); T. J. Bradley, 179 Longwood Ave., Boston, Mass. (1930); W. B. Philip, 201 Balboa Bldg., San Francisco, Calif. (1930); H. C. Christensen, 130 N. Wells St., Chicago, Ill. (1931); H. A. B. Dunning, Charles and Chase Sts., Baltimore, Md. (1931); S. L. Hilton, 1033 Twenty-Second St., N. W., Washington, D. C. (1931); J. H. Beal, Camp Walton, Fla. (1932); C. E. Caspari, Euclid and Parkview Aves., St. Louis, Mo. (1932); C. H. LaWall, 636 S. Franklin Square, Philadelphia, Pa. (1932).

Ex-Officio Members.—A. L. I. Winne, 712 State Office Bldg., Richmond, Va.; W. B. Goodyear, 1901 Derry St., Harrisburg, Pa.; E. F. Kelly, 10 W. Chase St., Baltimore, Md.; C. W. Holton, Box 81, Essex Fells, N. J.; E. G. Eberle, 10 W. Chase St., Baltimore, Md.; A. G. DuMez, Lombard and Greene Sts., Baltimore, Md.

OFFICERS OF THE COUNCIL.

Chairman, S. L. Hilton, 1033 22nd St., N. W., Washington, D. C.; *Vice-Chairman*, Charles H. LaWall, 636 S. Franklin Square, Philadelphia, Pa.; *Secretary*, E. F. Kelly, 10 W. Chase St., Baltimore, Md.

COMMITTEES OF THE COUNCIL.

Committee on Finance.—*Chairman*, Theodore J. Bradley, C. H. LaWall, C. W. Holton.

Committee on Property and Funds.—*Chairman*, H. A. B. Dunning, C. W. Holton, S. L. Hilton, T. J. Bradley, E. F. Kelly.

Committee on Publications.—*Chairman*, A. G. DuMez, H. V. Arny, C. H. LaWall, H. C. Christensen, E. G. Eberle, E. F. Kelly, C. W. Holton.

Committee on Standard Program.—*Chairman*, S. L. Hilton, T. J. Bradley, E. F. Kelly.

Committee to Confer with A. A. C. P. in Reference to A. Ph. A. Branches for Students.—*Chairman*, W. Bruce Philip, San Francisco; H. V. Arny, New York City; R. L. Swain, Baltimore.

THE HOUSE OF DELEGATES.

Officers of the House.—*Chairman*, R. L. Swain, 2411 N. Charles St., Baltimore, Md.; *Vice-Chairman*, C. B. Jordan, Lafayette, Ind.; *Secretary*, E. F. Kelly, 10 W. Chase St., Baltimore, Md.

COMMITTEES OF THE HOUSE OF DELEGATES.

Place of Meeting.—*Chairman*, T. J. Bradley, Boston, Mass.; R. A. Lyman, Lincoln, Neb.; W. F. Rudd, Richmond, Va.; C. G. Merrell, Cincinnati, Ohio; Laird J. Stabler, Los Angeles, Calif.

Patents and Trademarks.—*Chairman*, F. E. Stewart, Philadelphia, Pa.; S. C. Henry, Chicago, Ill.; F. W. Nitardy, Brooklyn, N. Y.; L. F. Kebler, Washington.

THE SECTIONS.

Scientific Section.—*Chairman*, H. A. Langenhan, % U. of Washington, Seattle, Wash.; *First Vice-Chairman*, E. E. Swanson, Indianapolis, Ind.; *Second Vice-Chairman*, W. J. Husa, Gainesville, Fla.; *Secretary*, L. W. Rowe, % Parke, Davis & Co., Detroit, Mich.; *Delegate to the House of Delegates*, James C. Munch, Baltimore, Md.

Committee on Ebert Prize.—*Chairman*, Glenn L. Jenkins, Baltimore, Md.; L. E. Warren, Washington, D. C.; Loyd Harris, Norman, Okla.

Board of Review on Papers.—*Chairman*, James C. Munch, Baltimore, Md.; L. W. Rowe, Detroit, Mich.; John C. Krantz, Jr., Baltimore, Md.

Committee on Minimum Requirements for Membership in Sections.—*Chairman*, Francis E. Bibbins, 5840 Washington Blvd., Indianapolis, Ind.; W. T. McCloskey, Washington, D. C.; C. B. Jordan, Lafayette, Ind.

Committee to Coöperate with National Conference on Pharmaceutical Research.—*Chairman*, John C. Krantz, Baltimore, Md.; L. E. Warren, Washington, D. C.; Heber W. Youngken, Boston, Mass.

Section on Education and Legislation.—*Chairman*, Glenn L. Jenkins, Lombard and Greene Sts., Baltimore, Md.; *Vice-Chairman*, B. V. Christensen, Gainesville, Fla.; *Secretary*, Rudolph H. Raabe, Ada, Ohio; *Delegate to House of Delegates*, W. F. Rudd, Richmond, Va.

Section on Practical Pharmacy and Dispensing.—*Chairman*, H. C. Newton, Omaha, Neb.; *Vice-Chairman*, Charles V. Netz, Minneapolis, Minn.; *Secretary*, E. O. Leonard, Pocatello, Idaho; *Delegate to the House of Delegates*, John C. Krantz, Jr., Baltimore, Md.

Committee on Glass Standardization and the Relation of Glass to the Preservation of Pharmaceutical Preparations.—*Chairman*, H. V. Arny, 115 W. 68th St., New York, N. Y.; I. A. Becker, Chicago, Ill.; Fitzgerald Dunning, Baltimore, Md.

Section on Commercial Interests.—*Chairman*, Denny Brann, Des Moines, Ia.; *Vice-Chairman*, Jos. G. Noh, Omaha, Neb.; *Secretary*, Rowland Jones, Gettysburg, So. Dak.; *Delegate to the House of Delegates*, R. B. Rothrock.

Section on Historical Pharmacy.—*Chairman*, George D. Beal, University of Pittsburgh, Pittsburgh, Pa.; *Secretary*, J. T. Lloyd, Court and Plum Sts., Cincinnati, O.; *Delegate to House of Delegates*, Lyman F. Kebler; *Historian*, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

STANDING AND SPECIAL COMMITTEES OF THE ASSOCIATION.

Elected by the Council.

Committee on National Formulary.—*Chairman*, to be elected. Gustav Bachman, Minneapolis, Minn.; H. A. Langenhan, Seattle, Wash.; E. N. Gathercoal, Chicago, Ill.; Louis Saalbach, Pittsburgh, Pa.; Paul S. Pittenger, Baltimore, Md.; Wilbur L. Scoville, Detroit, Mich.; O. A. Farwell, Detroit Mich.; H. V. Arny, New York, N. Y.; Bernard Fantus, Chicago, Ill.; Leonard Seltzer, Detroit, Mich.; E. L. Newcomb, New York, N. Y.; S. L. Hilton, Washington, D. C.; I. A. Becker, Chicago, Ill.; Glenn L. Jenkins, Baltimore, Md.; Adley B. Nichols, Philadelphia, Pa. *Associate Member*, the Chairman of the Revision Committee, U. S. Pharmacopœia.

Committee on Pharmaceutical Research.—*Chairman*, H. V. Arny, New York, N. Y. (1933); W. L. Scoville, Detroit, Mich. (1930); John C. Krantz, Jr., Baltimore, Md. (1930); Heber W. Youngken, Boston, Mass. (1931); E. N. Gathercoal, Chicago, Ill. (1931); J. A. Koch, Pittsburgh, Pa. (1932); Arno Viehoever, Philadelphia, Pa. (1932); Charles H. LaWall, Philadelphia, Pa. (1933); J. C. Peacock, Philadelphia, Pa. (1934); George D. Beal, Pittsburgh, Pa. (1934).

Committee on Unofficial Standards.—*Chairman*, E. N. Gathercoal (1931), Chicago, Ill.; E. S. Rose (1930), Iowa City, Ia.; H. H. Rusby (1930), Newark, N. J.; F. R. Eldred (1930), Jersey City, N. J.; E. V. Lynn (1930), Seattle, Wash.; C. M. Sterling (1931), Lawrence, Kans.; J. A. Koch (1931), Pittsburgh, Pa.; E. B. Fischer (1931), Minneapolis, Minn.; W. F. Sudro (1932), Fargo, N. Dak.; Hugo H. Schaefer (1932), New York, N. Y.; E. H. Gane (1932), New York, N. Y.; E. L. Newcomb (1932), New York, N. Y.; John Roberts (1933), Springfield, Pa.; Otto Raubenheimer (1933), Brooklyn, N. Y.; John C. Krantz, Jr. (1933), Baltimore, Md.; O. A. Farwell (1933), Detroit, Mich.

(Continued on page xii)

PFIZER'S CITRIC ACID

POWDERED CRYSTALS
GRANULATED

Eighty years of
Manufacturing experience

SODIUM CITRATE
POTASSIUM CITRATE
STRICTLY – U.S.P.

CHAS. PFIZER AND CO. INC.
MANUFACTURING CHEMISTS
ESTABLISHED 1849

81 MAIDEN LANE
NEW YORK
N. Y.

444 W. GRAND AVE.
CHICAGO
ILL.

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

Commission on Proprietary Medicines.—*Chairman*, J. H. Beal, Camp Walton, Fla. (1930); W. B. Day, Chicago, Ill. (1931); S. L. Hilton, Washington, D. C. (1932); C. E. Caspari, St. Louis, Mo. (1933); S. C. Henry, Chicago, Ill. (1934).

Appointed by the President.

Committee on the Study of Pharmacy.—E. F. Kelly, Baltimore, Md.; W. W. Horne, Fayetteville, N. C.; H. A. B. Dunning, Baltimore, Md.

Committee on Cosmetics.—*Chairman*, George D. Beal, Pittsburgh, Pa.; A. G. DuMez, Baltimore, Md.; Charles H. LaWall, Philadelphia, Pa.; F. W. Nitardy, New York, N. Y.; Bernard Fantus, Chicago, Ill.

Committee on Local Branches.—*Chairman*, C. Leonard O'Connell, Pittsburgh, Pa.; H. A. Langenhan, Seattle, Wash.; A. A. Wheeler, Detroit, Mich.; Adley B. Nichols, Philadelphia, Pa.; C. V. Netz, Minneapolis, Minn.; Edward Spease, Cleveland, O.; E. V. Kyser, Chapel Hill, N. C.

Board of Canvassers.—*Chairman*, L. F. Bradley, R. L. Quigley and A. C. Taylor, all of Washington.

Committee on Legislation.—*Chairman*, S. L. Hilton, Washington, D. C.; W. R. Montgomery, Butte, Mont.; F. C. Groover, Jacksonville, Fla.; C. G. Merrell, Cincinnati, O.; R. R. Patch, Stoneham, Mass.; F. B. Haymaker, Clarksburg, W. Va.; John Culley, Ogden, Utah; Ambrose Hunsberger, Philadelphia, Pa.; W. D. Adams, Forney, Tex.; Frank Nau, Portland, Ore.; George Judisch, Ames, Ia.; F. E. Mortenson, Hollywood, Calif.; H. C. Christensen, Chicago, Ill.

Committee on U. S. Pharmacopœia.—*Chairman*, L. F. Kebler, Washington, D. C. (1938); E. Fullerton Cook, Philadelphia, Pa. (1930); Arno Viehoever, Philadelphia, Pa. (1931); H. A. B. Dunning, Baltimore, Md. (1932); H. H. Rusby, New York, N. Y. (1933); W. B. Philip, San Francisco, Calif. (1934); William Mittelbach, Boonville, Mo. (1935); Reid Hunt, Boston, Mass. (1936); C. J. Clayton, Denver, Colo. (1937); E. N. Gathercoal, Chicago, Ill. (1939).

Committee on Recipe Book.—*Chairman*, J. Leon Lascoff, New York, N. Y. (1934); *Editor*, Ivor Griffith, Philadelphia, Pa. (1934); W. W. Horne, Fayetteville, N. C. (1930); S. L. Hilton, Washington, D. C. (1930); F. W. Nitardy, Brooklyn, N. Y. (1930); H. A. Langenhan, Seattle, Wash. (1930); Otto Raubenheimer, Brooklyn, N. Y. (1930); W. H. Glover, Lawrence, Mass. (1931); F. B. Kilmer, New Brunswick, N. J. (1931); W. L. Scoville, Detroit, Mich. (1931); C. P. Wimmer, New York, N. Y. (1931); R. R. Gerstner, New York, N. Y. (1931); J. K. Thum, Philadelphia, Pa. (1932); I. A. Becker, Chicago, Ill. (1932); C. J. Clayton, Denver, Colo. (1932); M. A. Davis, White Plains, N. Y. (1932); C. M. Roehr, San Francisco, Calif. (1932); Robert P. Fischelis, Trenton, N. J. (1933); Bernard Fantus, Chicago, Ill. (1933); William Gray, Chicago, Ill. (1933); L. D. Havenhill, Lawrence, Kans. (1933); E. Fullerton Cook, Philadelphia, Pa. (1933); E. N. Gathercoal, Chicago, Ill. (1934); H. L. Meredith, Fort Pierce, Fla. (1934); P. Henry Utech, Meadville, Pa. (1934).

Committee on Pharmaceutical Syllabus.—H. H. Rusby, Newark, N. J. (1930); Willis G. Gregory, Buffalo, N. Y. (1931); W. H. Rudder, Salem, Ind. (1932); W. C. Anderson, Brooklyn, N. Y. (1933); E. G. Eberle, Baltimore, Md. (1934); E. R. Serles, Brookings, S. Dak. (1935); R. A. Lyman, Lincoln, Neb. (1936).

Committee on Pharmacy Week.—*Chairman*, R. J. Ruth, 80 Beekman St., New York City; F. B. Kilmer, New Brunswick, N. J.; W. B. Day, Chicago, Ill.; W. B. Philip, San Francisco, Calif.; H. E. Duncan, Birmingham, Ala.

Committee on Horticultural Nomenclature.—*Chairman*, H. W. Youngken, Boston, Mass.; C. W. Ballard, New York, N. Y.; E. N. Gathercoal, Chicago, Ill.

Committee on Physiological Testing.—*Chairman*, P. S. Pittenger, % Sharp & Dohme, Baltimore, Md.; Wm. T. McCloskey, Washington, D. C.; L. W. Rowe, Detroit, Mich.; D. I. Macht, Baltimore, Md.; E. E. Swanson, Indianapolis, Ind.; J. C. Munch, Baltimore.

Committee on Weights and Measures.—*Chairman*, E. O. Leonard, Pocatello, Ida.; R. P. Fischelis, Trenton, N. J.; H. M. Fraser, University, Miss.; C. M. Snow, Chicago, Ill.; L. A. Thompson, Boston, Mass.

Committee on William Procter, Jr., Memorial Fund.—*Chairman*, James E. Hancock, Baltimore, Md.; A. R. L. Dohme, Baltimore, Md.; B. T. Fairchild, New York, N. Y.; E. G. Eberle, Baltimore, Md.; J. L. Lengfeld, San Francisco, Calif.; Henry T. Hopkins, Keyport, N. J.; W. B. Day, Chicago, Ill.; Parker Cook, Baltimore, Md.; J. K. Lilly, Indianapolis, Ind.; H. S. Wellcome, London, England; Charles G. Merrell, Cincinnati, Ohio; José P. Alacan, Havana, Cuba; C. H. Packard, Boston, Mass.; R. L. Quigley, Washington, D. C.

Committee on International Pharmaceutical Nomenclature.—*Chairman*, A. G. DuMez, Baltimore, Md.; Otto Raubenheimer, Brooklyn, N. Y.; H. W. Youngken, Boston, Mass.; Arno Viehoever, Philadelphia, Pa.; Horatio C. Wood, Philadelphia, Pa.

Coöperative Publicity Committee.—*Chairman*, Robert P. Fischelis, Trenton, N. J.; H. V. Arny, New York, N. Y.; Edwin L. Newcomb, New York, N. Y.; W. H. Cousins, Dallas, Texas; Ambrose Hunsberger, Philadelphia, Pa.

Committee to Coöperate with Committees from the A. A. C. P. and N. A. B. P. to Obtain Pre-requisite Legislation.—*Chairman*, C. B. Jordan, Lafayette, Ind.; W. B. Day, Chicago, Ill.; R. A. Lyman, Lincoln, Nebr.

Committee on Endowment Fund.—*Chairman*, J. H. Beal, Camp Walton, Fla.; C. O. Bigelow, New York N. Y.; Wm. B. Day, Chicago, Ill.; Theodore J. Bradley, Boston, Mass.; F. W. Sultan, St. Louis, Mo.

Campaign Committee A. Ph. A. Headquarters Building.—*Chairman*, H. A. B. Dunning, Baltimore, Md.; E. F. Kelly, S. L. Hilton, E. L. Newcomb, W. Bruce Philip, A. G. DuMez, E. G. Eberle; *Publicity Director*, E. L. Newcomb; *Associate Publicity Director*, Al Falkenhainer; *Director of Propaganda*, A. M. Hayes; *Business Manager*, F. C. Bortner; *Treasurer*, E. F. Kelly and State Chairmen.

Committee on Site, A. Ph. A. Headquarters Building.—*Chairman*, H. A. B. Dunning, Baltimore, Md.; C. H. LaWall, Philadelphia, Pa.; E. G. Eberle, Baltimore, Md.; M. G. Gibbs, Washington, D. C.; E. F. Kelly, Baltimore, Md.

Committee on Plans, A. Ph. A. Headquarters Building.—*Chairman*, H. A. B. Dunning, Baltimore, Md.; J. H. Beal, Camp Walton, Fla.; A. G. DuMez, Baltimore, Md.; E. L. Newcomb, New York, N. Y.; E. F. Kelly, Baltimore, Md.

Committee on Pharmacy Corps in the U. S. Army.—*Chairman*, R. L. Swain, Baltimore, Md.; A. L. I. Winne, Richmond, Va.; A. C. Taylor, Washington, D. C.; S. L. Hilton, Washington, D. C.; John C. Krantz, Jr., Baltimore, Md.; S. Y. Harris, Baltimore, Md.; B. Olive Cole, Baltimore, Md.

Committee on Transportation.—*Chairman*, T. J. Bradley, Boston, Mass. (associates to be named later).

International Pharmaceutical Federation.—*Delegates*, J. A. Koch, Pittsburgh, Pa.; W. L. Scoville, Detroit, Mich.; E. F. Cook, Philadelphia, Pa.; *Reporters*, E. G. Eberle, Baltimore, Md.; C. L. O'Connell, Pittsburgh, Pa.; Otto Raubenheimer, Brooklyn, N. Y.

American Association for the Advancement of Science.—J. A. Koch, Councilor.

National Drug Trade Conference Delegates.—J. H. Beal, S. L. Hilton, E. F. Kelly.

GENERAL MEMBERSHIP COMMITTEE.

Chairman, E. F. Kelly, 10 W. Chase St., Baltimore.

Boards of Pharmacy.—*Chairman*, L. L. Walton, Williamsport, Pa.; H. C. Christensen, Chicago, Ill.; L. E. Highley, Hot Springs, S. Dak.

Food and Drug Chemists.—*Chairman*, J. C. Munch, Baltimore, Md.; C. O. Ewing, Boston, Mass.; J. L. Mayer, New York, N. Y.; E. S. Rose, Iowa City, Iowa; A. R. Maas, Los Angeles, Calif.

Wholesale Druggists and Manufacturers.—*Chairman*, A. R. L. Dohme, Baltimore, Md.; E. F. Kemp, Washington, D. C.; W. T. Hover, Denver, Colo.; H. K. Mulford, Philadelphia, Pa.; R. E. L. Williamson, Baltimore, Md.; C. P. Van Schaak, Chicago, Ill.

Schools and Colleges of Pharmacy.—*Chairman*, B. V. Christensen, Gainesville, Fla.; C. H. LaWall, Philadelphia, Pa.; E. Spease, Cleveland, Ohio; R. A. Kuever, Iowa City, Ia.; P. H. Dirstine, Pullman, Wash.

DISTRICT NO. 1.—*Chairman*, I. P. Gammon, 1363 Beacon St., Brookline, Mass. Including Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island.

Connecticut.—*Chairman*, H. M. Lerou, Norwich; C. T. Hull, New Haven; P. J. Garvin, New Haven; C. T. Gilbert, Noroton.

Maine.—*Chairman*, G. O. Tuttle, Portland; J. H. Dow, Portland; M. L. Porter, Danforth.

(Continued on page xiv)

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

LOESER'S INTRAVENOUS SOLUTIONS

HAVE MADE INTRAVENOUS MEDICATION A SAFE PRACTICAL OFFICE TECHNIC

Interest and demand have been created. Are you getting your share of the business?

WANTED—Local co-operating dealers, preferably the ethical druggist catering to the physician.

Write for our local selling campaign, mentioning the Journal of the American Pharmaceutical Association.

LOESER LABORATORY
NEW YORK INTRAVENOUS LABORATORY
22 West 26th Street, New York City
Producing ethical intravenous solutions for the medical profession exclusively.

LIPOIODINE, "CIBA"

A modern way of prescribing the iodides

Physicians are showing a preference for LIPOIODINE, "CIBA" and we suggest that you be sure that your stock is adequate to meet an increased prescription demand.

LIPOIODINE, "CIBA" is issued in tablet form —in tubes of 20, and in bottles of 100.

Order from your jobber.

CIBA COMPANY
Incorporated
New York City

Massachusetts.—*Chairman*, C. H. Packard, East Boston; F. J. Amrhein, Needham; E. F. Leonard, Springfield; C. Fred Wright, Boston.

New Hampshire.—*Chairman*, Charles G. Shedd, Keene; G. H. Knowleton, Manchester; J. L. Dow, Lancaster.

Rhode Island.—*Chairman*, C. F. Gilson, Centredale; G. S. Morgan, Pawtucket; M. H. Corrigan, Providence.

Vermont.—*Chairman*, Wm. D. Kelley, North Troy; Hodgdon Shaw, Bellows Falls; Volney K. Young, Waterbury.

DISTRICT NO. 2.—*Chairman*, R. P. Fischelis, 28 W. State St., Trenton, N. J. Including New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, District of Columbia.

Delaware.—*Chairman*, J. O. Bosley, Wilmington; G. W. Rhodes, Newark; H. E. Culver, Middletown.

District of Columbia.—*Chairman*, L. F. Bradley, Washington; W. T. McCloskey, Washington; Norman D. Parker, Washington.

Maryland.—*Chairman*, C. L. Meyer, Baltimore; G. E. Pearce, Frostburg; B. Olive Cole, Baltimore; W. B. Spire, Mt. Rainier; W. C. Powell, Snow Hill.

New Jersey.—*Chairman*, Dudley Singer, Atlantic City; F. W. Warnke, Jersey City; C. W. Holton, Essex Fells; George C. Schicks, Jr., Montclair; E. R. Sparks, Burlington; A. C. Herting, Merchantville; C. J. McCloskey, Jersey City.

New York.—*Chairman*, J. Leon Lascoff, New York; E. S. Dawson, Jr., Syracuse; H. B. Smith, Brooklyn; H. J. Dimond, Buffalo; A. S. Wardle, Hudson.

Pennsylvania.—*Chairman*, Ambrose Hunsberger, Philadelphia; Russell R. Battershell, Pittsburgh; C. Leonard O'Connell, Pittsburgh; William J. Stoneback, Philadelphia; Frank H. Eby, Temple University, Philadelphia.

Virginia.—*Chairman*, A. L. I. Winne, Richmond; S. C. Brooks, Winchester; I. F. Truitt, Norfolk.

West Virginia.—*Chairman*, J. Lester Haymann, Morgantown; Roy B. Cook, Charleston; C. H. Goodykoontz, Bluefield; Gordon Bergy, Morgantown.

DISTRICT NO. 3.—*Chairman*, W. B. Day, 701 S. Wood St., Chicago, Ill. Including Ohio, Indiana, Illinois, Kentucky, Michigan, Missouri, Kansas.

Illinois.—*Chairman*, Wm. Gray, Chicago; Robert W. Sterling, Dickson; Mrs. M. H. Zwick, Oak Park; Byron Armstrong, Jacksonville; Fred W. Metzger, Springfield.

Indiana.—*Chairman*, F. W. Meissner, Jr., LaPorte; W. A. Oren, Indianapolis; C. B. Jordan, Lafayette; W. H. Rudder, Salem; B. M. Keene, Indianapolis.

Kansas.—*Chairman*, A. H. King, Manhattan; E. W. Cookson, Wichita; N. G. Edelblute, Topeka; Jonathan Schmitter, Gypsum; D. H. Spencer, Lawrence.

Kentucky.—*Chairman*, Addison Dimmitt, Louisville; J. W. Gayle, Frankfort; G. L. Curry, Louisville; L. A. Brown, Lexington.

Michigan.—*Chairman*, J. J. Burniac, Detroit; A. A. Wheeler, Detroit; W. C. Kirschgessner, Grand Rapids; M. S. Moore, Lansing; R. T. Lakey, Detroit; O. H. Haarer, Ann Arbor.

Missouri.—*Chairman*, F. J. Fricke, St. Louis; D. V. Whitney, Kansas City; W. H. Lamont, St. Louis; E. H. Riske, Independence; F. H. Swift, St. Louis.

Ohio.—*Chairman*, Edward Spease, Cleveland; F. H. Freericks, Cincinnati; Theo. D. Wetterstroem, Columbus; W. M. Bowman, Toledo; O. U. Cassaday, Youngstown; M. N. Ford, Columbus.

DISTRICT NO. 4.—*Chairman*, J. G. Beard, Chapel Hill, N. C. Including North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Florida, Arkansas, Louisiana, Oklahoma, Texas, Panama, Cuba, Porto Rico, Mexico.

Alabama.—*Chairman*, L. C. Lewis, Tuskegee; W. E. Bingham, Tuscaloosa; H. E. Duncan, Birmingham; Sam A. Williams, Troy; Carl Whorton, Gadsden.

Arkansas.—*Chairman*, Herbert W. Parker, Jonesboro; M. A. Eisele, Hot Springs; L. B. Snodgrass, Little Rock; W. I. Brite, Fort Smith; Booker Latimer, DeWitt.

Cuba.—*Chairman*, José P. Alacan, Havana; José Guillermo Diaz, Havana; Baudilio Castellanas, Mercane.

Florida.—*Chairman*, J. K. Attwood, Jacksonville; W. J. Husa, Gainesville; L. J. Taylor, Eustis; F. B. Stephens, St. Augustine; Leon Hale, Tampa.

Georgia.—*Chairman*, R. H. Land, Jr., Augusta; R. C. Wilson, Athens; Claude Rountree, Thomasville; McC. D. Hodges, Marietta; W. R. Bell, Atlanta.

Louisiana.—*Chairman*, John W. Collens, Monroe; Clovis J. Bouvier, Destrehan; Adam Wirth, New Orleans.

Mexico.—*Chairman*, G. G. Colin, Mexico City.

Mississippi.—*Chairman*, C. E. Wilson, Corinth; J. T. Mathis, Leland; W. B. Tabb, Houston; S. B. Key, Jackson; S. F. Pettis, Oxford.

North Carolina.—*Chairman*, J. G. Beard, Chapel Hill; W. W. Horne, Fayetteville; E. V. Zoeller, Tarboro; J. A. Goode, Asheville.

Oklahoma.—*Chairman*, Cecil G. Stewart, Tulsa; F. H. Hudelson, Weatherford; W. M. Kasl, Blackwell; D. B. R. Johnson, Norman; Tom Roach, Oklahoma City.

Panama.—*Chairman*, Bolivar Jurado, Panama City.

Porto Rico.—*Chairman*, Dr. Jacobo Simonet, Rio Piedras; Miguel A. Veve, Fajardo; Luis Mulet, Mayaguez; J. P. Serra, San Juan.

South Carolina.—*Chairman*, D. F. Riley, Florence; I. A. Rigby, Spartanburg; W. H. Zeigler, Charleston; J. D. Yongue, Pickens; Louis W. Rising, Columbia.

Tennessee.—*Chairman*, W. P. Winter, So. Nashville; J. W. Jones, Bristol; A. R. Bliss, Jr., Memphis; S. C. Davis, Nashville.

Texas.—*Chairman*, Henry F. Hein, San Antonio; W. J. Danforth, Fort Worth; W. D. Adams, Forney; W. H. Cousins, Dallas; W. F. Gidley, Austin.

DISTRICT NO. 5.—*Chairman*, George Judisch, Ames. Including Montana, Wisconsin, Iowa, Nebraska, Minnesota, North Dakota, South Dakota.

Iowa.—*Chairman*, John W. Slocum, Indianola; John M. Lindley, Winfield; W. M. Haire, Fort Dodge; Arthur C. Heidenrich, Des Moines; John Neufeld, Davenport.

Minnesota.—*Chairman*, Miss Maria Piesinger, Northfield; Gustav Bachman, Minneapolis; Miss Elizabeth N. Malerich, Minneapolis; Nelson W. Root, Owatonna; R. H. Gericke, Owatonna; A. L. Malmo, Duluth; J. B. Christgau, Owatonna.

Montana.—*Chairman*, J. W. Seiden, Lewistown; W. R. Montgomery, Butte; C. E. F. Mollett, Missoula; F. A. Scheuber, Livingston.

Nebraska.—*Chairman*, Will Brookley, Lincoln; Howard C. Newton, Omaha; William Walter, Beatrice; Melvin E. Rasdal, Ogallala; Fred Creutz, Wausa.

North Dakota.—*Chairman*, John J. Cowan, Bismarck; Edward A. Maerchlein, Ellendale; Fred A. Maser, Glen Ellen; N. N. Braake, McVille; W. P. Porterfield, Fargo.

South Dakota.—*Chairman*, E. R. Serles, Brookings; L. E. Highley, Hot Springs; J. J. McKay, Pierre; P. Bernhart, Sioux Falls; F. W. Brown, Lead.

Wisconsin.—*Chairman*, Edwin J. Boberg, Eau Claire; George L. Sontag, Neilsville; E. J. Raeuber, Milwaukee; Ralph W. Clark, Madison; W. W. Albers, Wausau.

DISTRICT NO. 6.—*Chairman*, Laird J. Stabler, Los Angeles. Including California, Nevada, Utah, Colorado, New Mexico, Arizona, Philippine Islands.

Arizona.—*Chairman*, A. L. Phelps, Phoenix; Seth P. Grandy, Mesa; J. B. Weber, Chandler; Fred W. Ritter, Phoenix; Arthur Hulett, Phoenix.

California.—*Chairman*, F. E. Mortenson, Hollywood; A. R. Maas, Los Angeles; W. B. Philip, San Francisco; G. H. P. Lichthardt, Sacramento; Louis Doerr, San José.

Colorado.—*Chairman*, J. P. Murray, Colorado Springs; C. J. Clayton, Denver; C. F. Poe, Boulder; John P. Dow, Lafayette; A. D. Baker, Denver.

Nevada.—*Chairman*, W. R. Englert, Elk; R. W. Fleming, Tonopah.

New Mexico.—*Chairman*, B. C. Ruppe, Albuquerque.

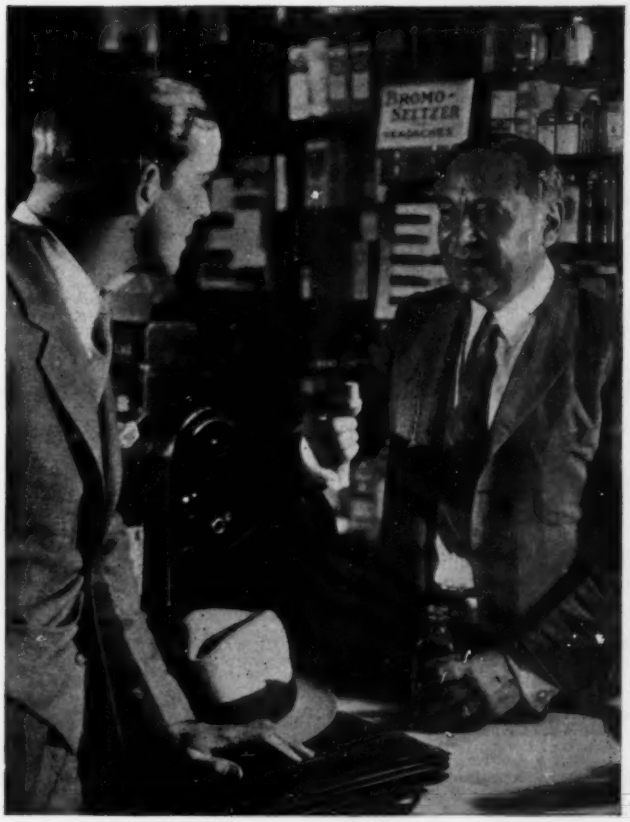
Philippine Islands.—*Chairman*, Eduardo A. Castilo, Manila; Petrocinio Valenzuela, Manila.

Utah.—*Chairman*, W. L. Eddy, Brigham City; Andrew F. Engberg, Salt Lake City; H. H. Petersen, Richfield.

(Continued on page xvi)

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

"Yes . . I use corks *my customers like them"*



"WHY do I use corks? Well, one of the big reasons is that my customers like them—and that's a reason with a lot of sense behind it. I've been in this business quite a few years now and one of the most important things I've learned is that giving customers what will do the job easiest and best is what keeps the cash register going. That's just what a cork does. It's the safest and surest closure for a bottle that ever was invented and yet, at the same time, it's the easiest to use. My customers know that from experience. They know that they can depend on corks to keep the contents safe and uncontaminated. They know that corks and cork-finished bottles stay cleaner and that they can pour better from a bottle like this because it has a pouring lip. Oh, there are lots of reasons but they all lead to the same answer. It's a cork every time as far as my trade is concerned and that goes for me, too."

If you should have any difficulty in getting genuine Armstrong's Corks, send a note to Armstrong Cork Company, 905 Arch St., Lancaster, Pa., and you will be put in touch with a dependable source of supply.

Armstrong's Corks

A grade for every need - - - Every sack guaranteed

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

(Continued from page xiv)

DISTRICT NO. 7.—*Chairman*, H. A. Langenhan, 5226—19th St., N. E., Seattle, Wash. Including Washington, Oregon, Idaho, Wyoming, Alaska.

Alaska.—*Chairman*, Z. J. Loussac, Anchorage; Elwyn Swetman, Seward; William Britt, Juneau.

Idaho.—*Chairman*, E. O. Leonard, Pocatello; L. L. Robertson, Nezperce; Charles Carter, Moscow.

Oregon.—*Chairman*, A. E. Crosby, The Dalles; Frank Nau, Portland; C. I. Clough, Tillamook; I. L. Betzel, Bend; Adolph Ziefle, Corvallis.

Washington.—*Chairman*, R. A. Cain, Seattle; P. H. Dirstine, Pullman; Paul S. Jorgenson, Seattle; L. W. Tobey, Seattle.

Wyoming.—*Chairman*, A. E. Roedel, Cheyenne; W. H. Edelman, Sheridan; O. A. Beath, Laramie.

DISTRICT NO. 8.—*Chairman*, Charles F. Heebner, Ontario College of Pharmacy, Toronto, Ontario; H. V. R. Moore, Toronto; Sydney V. Roth, Toronto; J. Lewis William, Three Rivers, Quebec; E. L. Woods, Saskatoon; Alex B. J. Moore, Montreal.

OFFICERS OF THE LOCAL BRANCHES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1927-28.

Secretaries will please report incorrections and elections. Also render reports of meetings. Thank you.

BALTIMORE.
No fixed meeting night.
President, Frank L. Black.
Vice-President, Aquila Jackson.
Secretary-Treasurer, B. Olive Cole.
Chairmen of Committees: Membership, Lawrence L. Miller; Professional Relations, E. G. Eberle; Science and Practice of Pharmacy, Glenn L. Jenkins; Education and Legislation, A. G. DuMez.

CINCINNATI.
Meet second Tuesday.
President, M. J. Blank.
Vice-President, Charles Henke.
Secretary, Bernard Kotte.
Treasurer, Edward Voss, Jr.
Delegate to the House of Delegates, A. Ph. A., Frank H. Freericks.

CHICAGO.
No fixed meeting night.
President, J. Harry Lindahl.
Vice-President, H. N. Bruun.
Second Vice-President, R. E. Terry.
Third Vice-President, Walter A. Harris.
Secretary-Treasurer, Sherman W. Morrison.
Delegate to House of Delegates, E. N. Gathercoal.
Chairmen of Committees: Membership, C. P. Van Schaack; Legislation, J. Riemenschneider; Practice, I. A. Becker; Medical Relations, Dr. Bernard Fantus; Publicity, Samuel C. Henry.

DETROIT.
Meet third Thursday.
President, Francis Koelzer.
First Vice-President, John Webster, Jr.
Second Vice-President, James Lidell.
Treasurer, F. F. Ingram, Jr.
Secretary, Bernard A. Bialk.
Delegate to the House of Delegates, E. P. Stout.
Chairman of Committees: Program, R. T. Lakey.
Council of Clerks, Luther Parker and Albert Feldman.
Council of Students, University of Michigan, J. H. Webster, Jr., and Donald Breisch; Detroit College of Pharmacy, Raymond Baker and M. Hayden; College of City of Detroit, Lyle Miller and Harold Heyn.

NEW YORK.
Meet second Monday.
President, Hugo H. Schaefer.
Vice-President, Richard H. Timmerman.
Secretary, Robert R. Gerstner.
Treasurer, Turner F. Currens.
Delegate to House of Delegates, Clyde L. Eddy.
Chairmen of Committees: Fraternal Relations, Harry Goldschmidt; Audit, Robert S. Lehman; Membership, H. B. Smith; Progress of Pharmacy, Reginald Dyer.

UNIVERSITY OF NORTH CAROLINA.
President, J. R. Curtis.
First Vice-President, D. P. Chamblee.
Second Vice-President, M. S. Burt.
Secretary-Treasurer, C. H. Oakley.

NORTHERN OHIO.
President, Edward Spease.
Vice-President, A. L. Flandermeyer.
Secretary, George Miller.
Treasurer, Paul Hudson.

NORTHWESTERN.
President, Rugnar Almin.
Secretary-Treasurer, Charles V. Netz.

PHILADELPHIA.
Meet second Tuesday.
President, Quintus Hoch.
First Vice-President, Louis Gershenfeld.
Second Vice-President, J. J. Kelly.
Secretary-Treasurer, Frank H. Eby.
Chairman of Committees: Practical Pharmacy, Charles T. Pickett; Professional Relations, Dr. Wilmer Krusen; Membership, Leo G. Penn; Entertainment, J. W. E. Harrisson.
Delegate to the House of Delegates, Ambrose Hunsberger.

PITTSBURGH.
President, John G. Rees.
Vice-President, Stephen Wilson.
Secretary, Frank S. McGinnis.
Treasurer, George Saylor.
Delegate to House of Delegates, Louis Emanuel.

UNIVERSITY OF WASHINGTON.
Meet last Thursday of month.
President, Earl Guth.
Vice-President, Einer E. Johnson.
Secretary-Treasurer, H. A. Langenhan.

College of Pharmacy and Chemistry, Detroit Institute of Technology

Equivalence to graduation from an accredited high school is required of all applicants for admission as candidates for a degree.

Three-year course in Pharmacy, leading to degree of Ph.C.
Four-year course in Chemistry, leading to degree of B.S.
Two-year course in Chemistry, leading to degree of Analytical Chemist (A.C.).

Each year through the cooperation of the College, the Alumni and Detroit Pharmacists, many students are placed in part-time positions.

Next Semester starts Sept. 16, 1929. Write for Catalog.

E. P. STOUT, Dean.

303 Y. M. C. A. Building Detroit, Michigan

Why use substitutes for

Lysol Disinfectant

REG. U. S. PAT. OFF.

MOST physicians believe in "Lysol" Disinfectant. They regard it as the best.

Yet there are many hospitals that use inferior substitutes for it, believing that they are effecting a legitimate saving thereby.

But "Lysol" Disinfectant costs practically the same as these preparations which expose the institution, the staff, and the patients to the serious risks of infection.

Under our Yearly Purchase Plan you can buy "Lysol" Disinfectant from 20 to 40% under our regular prices. You merely estimate in advance how much "Lysol" you will need in a year. We make deliveries in the amount and at the time you specify.

Let us give you the simple details of this money-saving plan. Just send the coupon.

Sole distributors: Lehn & Fink, Inc., Bloomfield, N. J.

LEHN & FINK, Inc., *Sole Distributors*, Dept. H79, Bloomfield, N. J.

Send us your NEW offer for supplying "Lysol" Disinfectant

Name of Hospital..... No. of Beds.....

Street.....

City..... State.....

Name of Buyer .....

Title.....

"Lehn & Fink Serenade" —WJZ and 14 other stations associated with the National Broadcasting Company—every Thursday at 8 p. m., Eastern time; 7 p. m., Central time.

STATE BOARDS OF PHARMACY MEMBERS AND SECRETARIES.

(List revised in accordance with information received to September 1, 1929.)

Alabama.—*President*, J. T. Dumas, Foley; *Secretary*, W. E. Bingham, Box 64, Tuscaloosa; *Treasurer*, S. A. Williams, Troy; H. E. Duncan, Birmingham; L. C. Lewis, Tuskegee.

Alaska.—*President*, William Britt, Juneau; *Vice-President*, Ralph T. Kubon, Fairbanks; *Secretary-Treasurer*, Elwyn Swetmann, Seward; N. R. Walker, Ketchikan; George L. Olson, Nome; Ralph Kitzmiller, Anchorage; F. M. Dunham, Fairbanks; F. D. Sheldon, Nome.

Arizona.—*President*, J. A. Dines, Tempe; *Vice-President*, H. Boyd Laird, Globe; *Secretary-Treasurer*, Arthur Lee Phelps, Phoenix; *Chairman of Examiners*, J. A. Dines, Tempe; E. M. F. Ivey, Warren; Marshall J. Nicholson, Willcox; Fred W. Moore, Flagstaff.

Arkansas.—*President*, Booker Latimer, DeWitt; *Vice-President*, H. H. Horst, Stuttgart; *Secretary*, H. W. Parker, Jonesboro; L. H. King, Little Rock; Edwin Bradley, Hot Springs.

California.—*President*, W. M. Fulton, Long Beach; *Secretary*, Louis Zeh, 316 State Office Building, San Francisco; J. H. McCracken, Dinuba; E. J. Molony, San Francisco; Frank Gardner, Riverside; V. L. Schaefer, Alameda; W. M. Fulton, Long Beach; Charles Swiggett, Los Angeles; Ralph E. Conley, Sacramento.

Colorado.—*President*, Joseph P. Murray, Colorado Springs; *Secretary*, Arthur D. Baker, 228 State Capitol Bldg., Denver; J. E. Stauffer, Rifle.

Connecticut.—*President*, John W. Marsland, New Britain; *Vice-President*, C. Thurston Gilbert, Noroton; *Secretary-Treasurer*, Herbert M. Lerou, Norwich; Louis Montanaro, New Haven; Charles Gustafson, Hartford.

Delaware.—*President*, George W. Rhodes, Newark; *Vice-President*, James W. Wise, Dover; Reuben M. Kaufman, Seaford; John O. Bosley, Wilmington; Thomas H. Cappeau, Wilmington.

District of Columbia.—*President*, A. C. Taylor, 150 C St., N. E., Washington, D. C.; *Secretary*, W. T. Kerfoot, Jr., 7th & L Sts., N. W., Washington, D. C.; *Treasurer*, F. T. Hafelfinger, 505 Pennsylvania Ave., N. W., Washington, D. C.; R. L. Quigley, 2036 G St., N. W., Washington, D. C.; Louis F. Bradley, 701 Maryland Ave., N. E., Washington, D. C.

Florida.—*President*, N. H. Hunter, Ft. Myers; *Vice-President*, H. H. D'Alamberte, Pensacola; *Secretary-Treasurer*, J. H. Haughton, Palatka; W. M. Hankins, Daytona; John K. Clemmer, Miami.

Georgia.—*President*, Jesse Mitchell, Macon; *Vice-President*, L. C. Waldrop, Tallapoosa; *Secretary*, J. B. Pendergrast, 420 Moreland Ave., N. E., Atlanta; W. T. Edmunds, Augusta; Charles H. Evans, Warrenton.

Idaho.—*Director*, Department of Law Enforcement, Charles Laurenson, Boise; *Commissioner*, F. A. Jeter, Boise; *Members of Examining Board*, J. P. Halliwell, Pocatello; H. M. Cummins, Melba; Loyd Harris, Lewiston.

Illinois.—*Director*, Department of Registration and Education, M. F. Walsh, Springfield; *Superintendent of Registration*, V. C. Michels, Springfield; Members of Examining Board: *President*, W. S. Denton, Springfield; *Secretary*, Robert W. Sterling, Dixon; L. P. Larson, 3201 W. Madison St., Chicago; J. A. Topf, 2000 Larrabee St., Chicago; A. M. Shelton, Springfield; Grover C. Bond, Mt. Vernon.

Indiana.—*President*, John A. J. Funk, Galveston; *Secretary*, C. E. Reed, State House, Indianapolis; F. W. Meissner, LaPorte; Russell B. Rothrock, Mt. Vernon; Scott Kelly, Gaston; Inspector, Paul E. Wolter, South Bend.

Iowa.—*Chairman*, J. W. Slocum, Indianola; *Secretary*, Walter F. Meads, Des Moines; George Judisch, Ames; John H. Weber, Cascade.

Kansas.—*President*, Mac Childs, Eldorado; *Secretary*, A. H. King, 306 Poyntz, Manhattan; *Treasurer*, Percy Walker, Topeka; Frank A. Milne, Pratt; Roy M. Riley, Wichita.

Kentucky.—*President*, Linwood A. Brown, Lexington; *Secretary*, J. W. Gayle, 228 W. Main St., Frankfort; *Treasurer*, George Wilhelmi, Louisville; George E. Porter, Berea; George D. Duncan, Franklin; William Votteler, Louisville.

Louisiana.—*President*, Edward H. Walsdorf, Canal at Rampart, New Orleans; *Secretary*, John E. Guess, Hammond; J. P. Campbell, Jr., Alexandria; Charles M. Daspit, Houma; W. E. Allen, Monroe; O. H. Jordan, Mansfield; W. E. Harter, R. F. D. 2, Box 46, New Orleans; Paul Eckels, Crowley; Wm. August Worner, New Orleans.

Maine.—*President*, Roy M. Hescock, Monson; *Secretary*, George O. Tuttle, Portland; Charles S. Pierce, Springvale.

Maryland.—*President*, J. Fuller Frames, 601 N. Gay Street, Baltimore; *Secretary-Treasurer*, Robert L. Swain, 2411 N. Charles St., Baltimore; George A. Bunting, 32nd and Falls Cliff Rd., Baltimore; William C. Powell, Snow Hill; Lloyd N. Richardson, Bel Air.

Massachusetts.—*President*, William R. Acheson, 33 Belmont Street, Cambridge; *Secretary*, Charles W. King, 146 State House, Boston; William Hardie, Fall River; Leon C. Ellis, Lynn.

Michigan.—*President*, Jacob C. Dykema, Grand Rapids; *Vice-President*, J. E. Richardson, Detroit; *Director*, Garfield M. Benedict, State Office Bldg., Lansing; Orville Hoxie, Grand Rapids; Clare F. Allan, Wyandotte; J. W. Howard Hurd, Flint.

Minnesota.—*President*, J. P. Jelinek, 961 W. 7th St., St. Paul; *Secretary*, John W. Dargavel, 2943—27th Avenue, South, Minneapolis; Marie A. Piesinger, Northfield; John E. Nelson, Lake Park; George T. Kermott, Duluth; Hugo O. Peterson, Minneapolis.

Mississippi.—*President*, D. E. Nabors, Indianola; *Vice-President*, D. M. Perkins, Corinth; *Secretary*, Kelly Patterson, Jackson; J. S. Puller, Starkville; Lew Wallace, Laurel.

Missouri.—*President*, H. W. Reuter, 5801 Gravois Ave., St. Louis; *Vice-President*, W. C. Bender, 11th and Frederick Streets, St. Joseph; *Secretary*, E. H. Riske, Watkins Bldg., Independence; W. W. Largent, Portageville; W. G. Hughes, Bucklin.

Montana.—*President*, John W. Seiden, Lewiston; *Vice-President*, Charles J. Chapple, Billings; *Secretary*, J. A. Riedel, Boulder; *Treasurer*, Alex F. Peterson, Missoula.

Nebraska.—*Secretary*, Dept. of Public Welfare, Ernest M. Pollard, ; *Director*, Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln; Members of Examining Board: *President*, W. B. Walter, Beatrice; A. E. Carlson, Danneborg; *Secretary*, Fred J. Creutz, Wausa.

Nevada.—*President*, W. R. Englert, Elko; *Secretary*, F. M. Clark, Las Vegas; H. H. Turrittin, Reno; R. W. Fleming, Tonopah; C. B. Loring, Fallon.

New Hampshire.—*President*, Frank R. French; Tilton; *Secretary*, James L. Dow, Lancaster; *Auditor*, John R. Kelley, Newport.

New Jersey.—*President*, Harry E. Bischoff, Union Hill; *Vice-President*, Dean B. Crawford, Atlantic City; *Secretary*, Robert P. Fischelis, 28 W. State St., Trenton; *Treasurer*, C. Graham McCloskey, Elizabeth; W. Scott Taylor, Trenton; Albert J. Smith, Bradley Beach.

New Mexico.—*President*, George H. Sasser, Clovis *Secretary-Treasurer*, David L. C. Hover, Cloudcroft W. E. Nutting, Raton; Charles R. McCartney, Silve City; Wm. McAdoo, Carlsbad.

New York.—*President*, J. Leon Lascoff, New York; *Vice-President*, Willis G. Gregory, Buffalo; *Secretary*, George W. Mather, Education Bldg., Albany; George C. Diekman, New York; Jacob Diner, New York; William Mansfield, Albany; T. Bruce Furnival, Syracuse; Frederick C. A. Schaefer, Brooklyn; Frank S. Houck, Gloversville; Charles B. Sears, Auburn.

North Carolina.—*President*, E. V. Zoeller, Tarboro; *Secretary-Treasurer*, F. W. Hancock, Oxford; I. W. Rose, Rocky Mount; C. P. Greyer, Morganton; James G. Ballew, Lenoir.

North Dakota.—*President*, W. P. Porterfield, Fargo; *Secretary*, P. H. Costello, Cooperstown; E. P. Martin, Hazen; Burt Finney, Bismarck; W. H. Schram, Hillsboro.

(Continued on page xx)

The Massachusetts College of Pharmacy

Longwood Avenue **Boston, Massachusetts**

A College of Pharmacy, controlled and managed by pharmacists, in which the teaching is largely by the laboratory method. The possession of a liberal endowment makes it possible to give superior courses at moderate cost to the student.

Graduation from a recognized high school or an equivalent education, shown by certificate or examination, is required for entrance.

Three-year course, leading to the degree of Graduate in Pharmacy.

Many students work for a part of the time while taking the courses. The College is frequently able to assist such students in finding positions.

The annual session begins during the latter part of September and ends during May.

The Demand for Graduates of this School is in Excess of the Supply.

For catalogue and further information, write to

THEODORE J. BRADLEY, Dean

ST. LOUIS COLLEGE OF PHARMACY

Graduation from an accredited high school or certificate showing equivalent of High School graduation necessary for admittance to the Degree Courses.

Three years leading to the degree Graduate in Pharmacy (Ph.G.).
Four years leading to the degree of Pharmaceutical Chemist (Ph.C.).
Special students admitted to any course.

Next session begins September 30, 1929.

For information write: Charles E. Caspari, Dean, 4588 Parkview, St. Louis, Mo.

School of Pharmacy, University of Maryland

(Maryland College of Pharmacy, 1841-1904)
LOMBARD AND GREENE STS., BALTIMORE, MD.

Graded course leading to Graduate in Pharmacy (Ph.G.) upon completion of three years' work, and Bachelor of Science in Pharmacy (B.S. in Phar.) upon completion of an additional year's work. Graduation from high school, or its equivalent, entrance requirement. For catalogue giving details apply to the Dean.

University of Illinois School of Pharmacy *CHICAGO COLLEGE OF PHARMACY*

Offers a three-year course for Pharmaceutical Chemist

Next school year begins October 1, 1929. Graduation from an accredited high school with 15 units in acceptable subjects is the entrance requirement.

For bulletin, address W. B. Day, Dean, 715 So. Wood Street, Chicago.

Pittsburgh College of Pharmacy
School of Pharmacy, University of Pittsburgh

¶ Offers a three years' course leading to the degree of Graduate in Pharmacy. Four years for the degree of Pharmaceutical Chemist.

For Catalogue address—CARL SAALBACH, PH.G., Registrar,
1431 Boulevard of the Allies, Pittsburgh, Pa.

SCHOOL OF PHARMACY, NORTH PACIFIC COLLEGE OF OREGON

Albert Schneider, Dean

The Annual session begins September 23, 1929. A four-year high school course or its educational equivalent is required of all entering students. Ph.C. degree is conferred upon completion of the three-year course; B.S. in Pharmacy upon the completion of four years' work.

For catalog and full information address

THE REGISTRAR

East Sixth & Oregon Sts. **Portland, Oregon.**

Purity-Quality Standard

ESSENTIAL OILS

Fritzsche Brothers, Inc.
New York

Mention the Journal of the A. Ph. A. when writing advertisers—It identifies you.

Ohio.—*President*, Charles Ehlers, Cincinnati; *Vice-President*, Ralph C. Knisely, Ravenna; *Secretary*, M. N. Ford, 608 High-Long Bldg., Columbus; A. L. Flandermeyer, 3501 Library Ave., Cleveland; F. H. King, Delphos; John S. Rutledge, Akron.

Oklahoma.—*President*, Cecil G. Steward, Tulsa; *Secretary*, C. M. Anderson, State Capitol, Oklahoma City; *Treasurer*, W. C. Alston, Checotah; Albert Easton, Weatherford; Roy L. Sanford, Enid.

Oregon.—*President*, W. Hal McNair, Ashland; *Secretary*, Frank S. Ward, 215 Medical Arts Building, Portland; *Treasurer*, A. E. Crosby, The Dalles; F. R. Peterson, Portland; E. E. Magee, Klamath Falls.

Pennsylvania.—*Chairman*, Charles C. Campbell, Pittsburgh; *Secretary*, Charles F. Kramer, Harrisburg; L. L. Walton, Williamsport; John M. Woodside, Philadelphia; Percy M. Davis, Scranton.

Porto Rico.—*President*, Carlos A. del Rosario, Santurce; *Secretary*, Carlos Garcia de Quevedo, 3 Allen St., San Juan; *Treasurer*, Ramon L. Doubon, Santurce; Luis E. Remus, Santurce; Luis G. Hernandez, Santurce.

Rhode Island.—*President*, William R. Fortin, Pawtucket; *Secretary-Registrar*, Michael H. Corrigan, Providence; Howard A. Pearce, Providence; Herve J. Brunelle, Woonsocket; Earl H. Mason, Pawtucket; Clarence A. Vars, Westerly; Thos. E. Hunt, Newport.

South Carolina.—*Chairman*, Ransome J. Williams, Mullins; *Secretary*, W. J. Wannamaker, Orangeburg; R. C. Garland, Gaffney; J. E. Stokes, Newberry; Sam B. Mitchell, Sumter; John H. Frierson, Charleston; L. E. Bishop, Laurens.

South Dakota.—*President*, H. J. Schnaidt, Parkston; *Secretary*, Rowland Jones, Gettysburg; George E. Sherman, Huron; F. L. Vilas, Pierre.

Tennessee.—*President*, R. R. Ferrell, Memphis; *Vice-President*, Gay Clark, Morristown; *Secretary*, Jerome B. Sand, Nashville; Samuel C. Davis, Nashville; Frank M. Bogart, Chattanooga.

Texas.—*President*, John A. Weeks, Ballinger; *Secretary*, W. H. Cousins, Box 1536, Dallas; *Treasurer*, C. B. Allison, Dallas; Paul Caroll, Texarkana; E. M. Joseph, Austin; Frank A. Walter, San Antonio; R. R. Townsend, Lamesa.

Utah.—*Director*, Department of Registration, S. W. Golding, Salt Lake City; *Secretary*, W. H. Dayton, Salt Lake City; *Chairman*, John Culley, Ogden; Archibald Bevan, Tooele; Frank J. Folland, Salt Lake City.

Vermont.—*President*, Ralph C. Root, Brattleboro; *Secretary*, Fred D. Pierce, Barton; *Treasurer*, Harris W. Alexander, St. Albans; Wm. H. Saunders, Lyndonville; Owen McShane, Poultney.

Virginia.—*President*, W. L. Lyle, Bedford; *Vice-President*, H. C. Littlejohn, Leesburg; *Secretary-Treasurer*, A. L. I. Winne, 712 State Office Building, Richmond S. C. Brooks, Winchester; J. C. Kearfoot, Martinsville; D. E. Seagle, Pulaski.

Washington.—*Department of Licenses, Director*, Charles R. Maybury, Olympia; *Assistant Director*, George L. Berger, Olympia. *Members Pharmacy Examining Board:* G. Elmer Brown, Seattle; Guy Norton, Tacoma; Charles Young, Centralia.

West Virginia.—*President*, S. M. Scott, Jr., Terra Alta; *Secretary*, Alfred Walker, Sutton; Frank B. Haymaker, Clarksburg; Mrs. M. H. Judy, Petersburg; Roy B. Cook, Charleston.

Wisconsin.—*President*, Oscar Rennebohm, Madison; *Secretary*, H. G. Ruenzel, 2332 Vliet St., Milwaukee; Edwin Boberg, Eau Claire; B. J. Kremer, Fond du Lac; G. V. Kradwell, Racine.

Wyoming.—*President*, A. E. Roedel, Cheyenne; *Vice-President*, C. C. Earl, Lander; *Secretary*, R. C. Shultz, Worland.

Officers National Association Boards of Pharmacy.—*President*, John A. J. Funk, Galveston, Ind.; *Treasurer*, J. W. Gayle, Frankfort, Ky.; *Chairman Executive Committee*, John Culley, Salt Lake City, Utah; *Director Post-Graduate Instructors*, R. L. Swain, Baltimore, Md.; *Secretary*, H. C. Christensen, 130 N. Wells St., Chicago; H. M. Lerou, Norwich, Conn. and A. C. Taylor, Washington, D. C.

Publications for the Pharmacist

National Formulary V, $3.50.

Pharmaceutical Recipe Book, $5.00.

Order from

J. B. Lippincott Co.,

East Washington Square, Philadelphia.

Year Books, A. PH. A., $4.00.

Bound Journals, $6.00.

Single copies, 35 cents, but advanced charges must be made for earlier copies.

Prior Issues, N. F. Back Numbers of Proceedings—ask for prices.

Order

Year Books and Journals

from

American Pharmaceutical Association

10 West Chase St., BALTIMORE, MD.

Reprints

"A Half Century of the National Formulary"—English names, titles, synonyms, etc., 100 pp., paper cover, $1.00.

"Reciprocity Explained," 5 cents per copy.

"Prerequisite Legislation," 5 cents per copy.

"The Pharmacology of Ergot: with Particular Respect to Its Biological Assay and Standardization" (19 pages), by Marvin R. Thompson, 25 cents per copy.

"Professional Pharmacy"—An Address, by Dean C. B. Jordan, 10 cents per copy.

"Syrup of Ferrous Iodide and the Official Hydriodic Preparations," paper cover, 20 cents per copy.

"A Pharmaceutic Study of Magma Magnesiae—1900–1930," paper cover, 25 cents per copy.

"A Literature Review on the Production of Antirachitic Substances by Irradiation Process," paper cover, 25 cents per copy.

Others to follow.

Order from

American Pharmaceutical Association

10 West Chase St., BALTIMORE, MD.

CONFERENCES.

Drug Trade Bureau of Public Information.—Members, the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Retail Druggists, the National Wholesale Druggists' Association, the Proprietary Association, the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy.

President, Ambrose Hunsberger, Philadelphia, Pa; *Director*, Robert P. Fischelis, 640 W. State St., Trenton, N. J.; *Secretary-Treasurer*, H. C. Christensen, 130 N. Wells St., Chicago, Ill.

National Conference of Pharmaceutical Research.—*Chairman*, E. N. Gathercoal, Chicago, Ill.; *Vice-Chairman*, E. Fullerton Cook, Philadelphia, Pa.; *Secretary*, J. C. Krantz, Jr., Baltimore, Md.; *Treasurer*, P. I. Heiusler.

Conference of Pharmaceutical Association Secretaries.—*President*, W. Bruce Philip, San Francisco, Calif.; *First Vice-President*, J. G. Beard, Chapel Hill N. C.; *Second Vice-President*, Walter D. Adams, Forney, Tex.; *Secretary-Treasurer*, Charles J. Clayton, Denver, Col.; *Executive Committee.—Chairman*, P. J. Garvin, New Haven, Conn.; W. B. Day, Chicago, Ill.; A. C. Taylor, Washington, D. C.; J. L. Hayman, Morgantown, W. Va. Meeting will be held in Baltimore, during week of May 5, 1930.

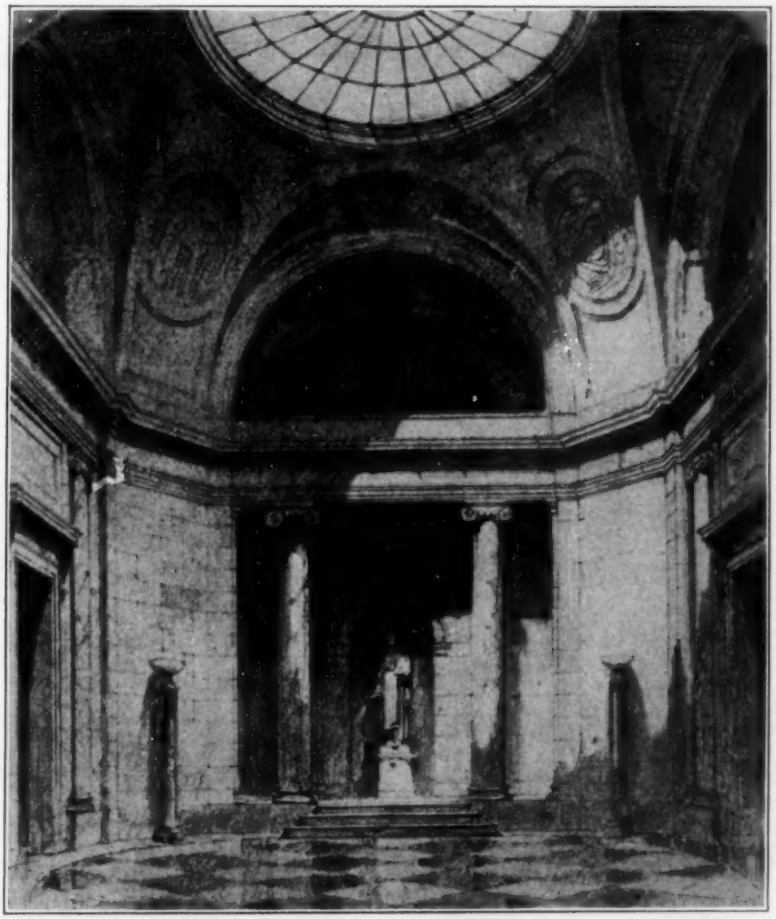
Conference of Pharmaceutical Law Enforcement Officials.—*Chairman*, R. L. Swain, 2411 N. Charles St., Baltimore, Md.; *Secretary*, M. N. Ford, 608 High-Long Building, Columbus, Ohio.

National Drug Trade Conference.—*President*, Samuel C. Henry, Chicago, Ill.; *Vice-President*, H. C. Christensen, Chicago, Ill.; *Secretary-Treasurer*, E. F. Kelly, Baltimore.

Plant Science Seminar.—*Chairman*, to be elected; *Secretary-Treasurer*, O. P. M.-Canis, Ozone Park, N. Y.; *Delegates to the Conference on Pharmaceutical Research*, L. J. Schwartz and E. N. Gathercoal. Meets Baltimore, Md., week of May 5, 1930.

International Pharmaceutical Federation.—*President*, L. van Itallie, The University, Leyden, Holland; *General Secretary*, J. J. Hofman, 4 Schenkweg, The Hague, Holland.

Hospital Pharmacists' Association of Southern California.—*President*, Claude Simpson, Methodist Hospital; *Vice-President*, Helen Dumbach, Good Samaritan; *Secretary-Treasurer*, Grace Palmer, Glendale Sanitarium.



ARCHITECTS' SKETCH OF A MEMORIAL ENTRANCE HALL FOR THE PHARMACY HEADQUARTERS BUILDING AT WASHINGTON, D. C.

OFFICERS OF PHARMACEUTICAL ASSOCIATIONS—1929.

Secretaries are respectfully asked to assist in correcting this list and make the roster a mutual service.

Alabama.—*President*, James T. Dumas, Foley; *First Vice-President*, W. W. Walker, Birmingham; *Second Vice-President*, Z. C. Lewis, Montgomery; *Secretary*, W. E. Bingham, Tuscaloosa; *Treasurer*, Wilbur Ward, Tuscaloosa. *Place of Meeting*, Havana, Cuba. *Time*, 1930.

Arizona.—*President*, F. C. McAlpin, Kingman; *Vice-President*, Jack Robertson, Phoenix; *Secretary-Treasurer*, Arthur G. Hulett, Phoenix. *Place of Meeting*, Prescott. *Time*, September or October, 1930.

Arkansas.—*President*, M. D. Daggett, Marianna; *Vice-Presidents*, John P. Cox, Hope; W. B. Ferguson, Paragould; *Treasurer*, J. K. Poch, Jr., North Little Rock; *Secretary*, E. D. Oslin, Little Rock. *Place of Meeting*, Hot Springs. *Time*, 1930.

California.—*President*, A. H. Vossmeyer, Los Angeles; *First Vice-President*, Thomas J. Lenehan, San Francisco; *Second Vice-President*, D. D. Wray, San Diego; *Third Vice-President*, Henry Gonzales, Oakland; *Treasurer*, Harvey A. Henry, Los Angeles; *Secretary*, Thomas W. Jones, Los Angeles.

Colorado.—*President*, John M. James, Pueblo; *First Vice-President*, Monte L. Powell; *Second Vice-President*, David B. Frey, Colorado Springs; *Treasurer*, Julius F. Earnest, Denver; *Secretary*, Charles J. Clayton, 1643 Lawrence St., Denver.

Connecticut.—*President*, John E. F. Jones, Bridgeport; *First Vice-President*, George Rapport; *Second Vice-President*, Hugh P. Beirne, New Haven; *Secretary-Treasurer*, P. J. Garvin, 20 Lake Place, New Haven.

Delaware.—*President*, Walter R. Keys, Clayton; *Vice-Presidents*, James T. Challenger, New Castle; Hewitt K. McDaniel, Dover; George E. Swain, Georgetown; *Secretary*, Albert Dougherty, Wilmington; *Treasurer*, Peter T. Bienkowski, Wilmington.

District of Columbia.—*President*, Paul Pearson; *First Vice-President*, William P. Herbst; *Second Vice-President*, A. V. Burdine; *Secretary-Treasurer*, A. C. Taylor.—All of Washington. Monthly meetings—second Tuesday each month. *Annual Meeting*, Raleigh Hotel, April 10th.

Florida.—*President*, William Emrich, Orlando; *First Vice-President*, Harry Childs, St. Petersburg; *Second Vice-President*, R. G. Richards, Ft. Myers; *Third Vice-President*, N. S. Avinger, Jacksonville; *Secretary*, L. J. Taylor, Box 816, Eustis.

Georgia.—*President*, Walter D. Jones, Savannah; *First Vice-President*, Thomas C. Marshall, Atlanta; *Second Vice-President*, Claud Rountree, Thomasville; *Third Vice-President*, J. L. Hawk, Atlanta; *Secretary-Treasurer*, Robert C. Wilson, Athens, Ga. *Place of Meeting*, —. *Time*, 1930.

Idaho.—*President*, A. A. Walker, Boise; *First Vice-President*, J. B. Ostrander, Wallace; *Second Vice-President*, Horace Whittlesey, Pocatello; *Secretary-Treasurer*, Herschel M. Cummins, Melba. *Place of Meeting*, Boise. *Time*, 1930.

Illinois.—*President*, Archer T. Davis, Decatur; *First Vice-President*, F. E. Neupert, Danville; *Second Vice-President*, Leo Mrazek, Chicago; *Third Vice-President*, George C. Parks, Anna; *Treasurer*, George M. Bennett, Urbana; *Secretary*, William B. Day, 715 So. Wood St., Chicago, Ill.

Indiana.—*President*, C. E. Nelson, Hammond; *First Vice-President*, E. H. Miller, Ft. Wayne; *Second Vice-President*, Mary Forsythe, N. Manchester; *Third Vice-President*, Asa E. Smith, Logansport; *Secretary*, Frank V. McCullough, 501 Elsby Bldg., New Albany; *Treasurer*, J. W. Weis, Hammond.

Iowa.—*President*, Robert M. Gibson, Des Moines; *First Vice-President*, Paul J. Jepson, Newton; *Second Vice-President*, Ernest L. Beezley, Cedar Rapids; *Secretary*, J. W. Slocum, Indianola; *Treasurer*, J. M. Lindly, Winfield; *Delegate to A. Ph. A.*, George Judisch, Ames. *Place of Meeting*, Des Moines. *Time*, 1930.

Kansas.—*President*, Charles M. McCaughan, Eldorado; *First Vice-President*, Clarence Redmond, Topeka; *Second Vice-President*, Joe Demain, Macksville; *Secretary-Manager*, Roy Reese, 824 Kansas Ave., Topeka; *Treasurer*, N. G. Edelblute, Topeka; *Librarian*, L. D. Havenhill, Lawrence. *Place of Meeting*, Wichita. *Time*, April 1930.

Kentucky.—*President*, Clarence E. Davis, Louisville, *First Vice-President*, W. H. Paynter, Louisville; *Secretary*, J. W. Gayle, Frankfort; *Treasurer*, William J. Johnson, Mayfield.

Louisiana.—*President*, Paul C. Weilbaecher, New Orleans; *Vice-Presidents*, J. Marion Legendre, New Orleans; Paul C. Eckels, Crowley; C. R. Caldwell, Shreveport; E. W. Vogt, Ferriday; T. L. Cronan, Port Allen; Alfred B. Cobb, Jena; *Treasurer*, Adam Wirth, New Orleans; *Secretary*, John E. Scott, 3340 Esplanade Ave., New Orleans; *Corresponding Secretary*, George J. Feldner, New Orleans.

Maine.—*President*, Francis F. Frawley, Bangor; *First Vice-President*, Lewis A. Barrows, Newport; *Second Vice-President*, Roy M. Hescock, Monson; *Third Vice-President*, Leon H. Marr, Farmington; *Treasurer*, Dr. M. L. Porter, Danforth; *Secretary*, James H. Allen, Waterville.

Maryland.—*President*, George W. Colborn, Jr., Princess Anne; *First Vice-President*, L. S. Williams, Baltimore; *Second Vice-President*, W. B. Spire, Mount Rainier; *Third Vice-President*, L. M. Kantner, Baltimore; *Secretary*, E. F. Kelly, Baltimore; *Treasurer*, G. P. Hetz, Baltimore; *Editor*, R. L. Swain.

Massachusetts.—*President*, Anthony Alteri, Springfield; *First Vice-President*, T. Willard Burke, Lynn; *Second Vice-President*, Joseph F. Sisson, Boston; *Treasurer*, Lyman W. Griffin, Allston; *Secretary*, Carl G. A. Harring, Dorchester.

Michigan.—*President*, Claude C. Jones, Battle Creek; *First Vice-President*, John L. Watts, Saginaw; *Second Vice-President*, Alex Reid, Detroit; *Secretary*, R. A. Turrel, Croswell; *Treasurer*, P. W. Harding, Yale.

Minnesota.—*President*, Gil A. Thompson, St. Paul; *Vice-President*, Joseph Vadheim, Tyler; *Second Vice-President*, H. O. Tiegen, Moorhead; *Third Vice-President*, N. Vere Sanders, Albert Lea; *Secretary*, Gustav Bachman, Minneapolis; *Treasurer*, H. Martin Johnson, St. Paul; *Executive Committee*, J. B. Christgau, A. L. Malmo and F. W. Moudry. *Place of Meeting*, Minneapolis. *Time*, February 12–14, 1930.

Mississippi.—*President*, Charles E. Wilson, Corinth; *First Vice-President*, T. D. Chilton, Vicksburg; *Second Vice-President*, Walter N. Temple, Bude; *State Organizer*, C. E. Anding, Flora; *Secretary-Treasurer*, A. S. Coody, Jackson. *Place of Meeting*, Vicksburg. *Time*, June 1930.

Missouri.—*President*, C. W. Hutchason, Kansas City; *Honorary President*, Hall Hess, Kansas City; *First Vice-President*, A. L. Rosse, Fayette; *Third Vice-President*, C. M. Pfalzgraf, Kansas City; *Secretary*, W. H. Lamont, 5838 Plymouth Ave., St. Louis; *Treasurer*, William Mittelbach, Booneville; *Historian*, Ambrose Mueller, Webster Groves.

Montana.—*President*, Fred P. Rickson, Billings; *First Vice-President*, S. O. Clinton, Butte; *Second Vice-President*, Charles W. Rank, Virginia City; *Third Vice-President*, R. A. Griffin, St. Ignatius; *Secretary*, J. A Riedel, Boulder; *Treasurer*, Mae C. Higgins, Manhattan.

Nebraska.—*President*, Smith C. Wilson, Lincoln; *Vice-Presidents*, M. E. Rasdal, Ogallala; E. V. Allen, Indianola; Jerry Hlava, Omaha; W. E. James, Palmer; L. W. Gorton, Omaha; *Treasurer*, D. D. Adams, Nehawka; *Secretary*, J. G. McBride, Lincoln. *Place of Meeting*, Omaha. *Time*, June 9–12, 1930.

(Continued on page xxiii)

rest and sleep . . .

SAFE

NON-NARCOTIC

QUICK IN ACTION

RAPIDLY ELIMINATED, NOT DEPRESSING TO HEART OR RESPIRATION

DO you know why so many physicians have taken so readily to prescribing Elixir Alurate? Because with only small doses of Elixir Alurate the physician finds that he can secure for his insomnia sufferers sleep of just the right quality and duration. Patients report a good night of calm, undisturbed rest, clear-headedness on awakening and a tip-top feeling of well-being they do not always get with other hypnotics.

Have Elixir Alurate on your shelves in readiness for the winter months. It is extensively prescribed for rest and sleep during influenza and pneumonia, for insomnia, and nervousness of all types, as a cough sedative, and for migraine, the menopause, hysteria, chorea, epilepsy, dementia praecox, alcoholism, etc.

Hoffmann-La Roche, Inc.

Makers of Medicines of Rare Quality

NUTLEY NEW JERSEY

Telling the Ten Million!

Parke-Davis advertising on Standardized Cod-liver Oil is appearing each month in leading magazines which reach more than ten million families, the cream of the national market. An easily arranged display in your window or on your counter will tie up with this big national campaign—will bring you profitable new business. These full-page advertisements are saying to your customers, "Ask your druggist for Parke-Davis Standardized Cod-liver Oil." There never was a better time to feature it!

PARKE, DAVIS & COMPANY

THE SATURDAY EVENING POST
Strength from the Sea when the Sun goes South
On October 21, the sun started off for his winter vacation in the south. From November till May he is but a pale ghost of his summer self, and his health-giving rays, so rich in vitamin-power, reach us for only a short time each day.
But, by a wise provision of Nature, we find stored up for us a precious supply of vitamins in the livers of the codfish that swarm off the fishing banks in fall and winter. So bountiful is this supply of vitamins that cod-liver oil is recognized as the greatest natural source of both Vitamins A and D.
Because it is rich in Vitamin A, cod-liver oil helps to promote growth and build up resistance to disease. Physicians very often prescribe cod-liver oil for children at this time of year to help them through the winter—to help keep them free from colds and other illnesses. Grown-ups, also, whose resistance is too low to withstand the exposures of winter, are finding cod-liver oil a sensible thing to take.
Because it contains also Vitamin D, cod-liver oil is a valuable aid in the prevention of rickets. Thousands of happy, growing youngsters have straight, sturdy limbs and sound teeth due to the cod-liver oil which they have taken regularly since babyhood.
When your physician prescribes cod-liver oil for you or for your children, you naturally want a cod-liver oil of the highest purity—and, above all, one that is exceptionally rich in vitamins. In Parke-Davis Standardized Cod-liver Oil the quantity of vitamins is definitely measured by a series of rigid standardization tests. Each teaspoonful contains as much resistance-building Vitamin A as one pound of the best creamery butter, or 11 pints of whole milk, or 9 eggs; and as much rickets-preventing Vitamin D as 7½ eggs.
Ask your druggist for Parke-Davis Standardized Cod-liver Oil. He has it in two sizes—4-ounce and 16-ounce bottles.
PARKE, DAVIS & COMPANY
The world's largest makers of pharmaceutical and biological products
Parke-Davis
STANDARDIZED
Cod-liver Oil